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DELAWARE MEDICAL JOURNAL

INDEX — PART 1

TEXT TITLES

Volume 43 January-December 1971

A

AMA Drug Evaluations, Book Review
  Harry F. Dowling, M.D. vii 202
Ambulatory Medicine, Outpatient Services
  and Medical Practices,
  An Overview of (H)
  John D. Stoeckle, M.D. iv 108
Annual Congress on Medical
  Education (SR)
  E. Wayne Martz, M.D. viii 220
Antibiotic Combinations,
  Maxwell Finland, M.D. xi 296
Antimicrobial Susceptibility Testing —
  Its Value and Limitations in Medical
  Practice,
  Allan R. Ronald, M.D. xi 308
Antimicrobial Therapy, Complications of
  Marvin Turck, M.D. xi 302
Arrhythmias in Myocardial Infarction,
  Roman W. DeSanctis, M.D. viii 209
Arthroscopy of the Knee Joint (H)
  S. Ward Casscells, M.D. iv 107
Atherosclerosis: A Discussion of
  Factors in Cause and Treatment,
  Leslie Wiener, M.D. vii 188
Australia Today, Medicine in
  Alister Brass, M.A., B.M., B.Ch. iv 94

B

Bacterial Infections, Initial Therapy of
  Serious
  Christopher M. Martin, M.D. iv 91
Beta-Adrenergic Blocking Agent
  (Propranolol), Review of
  Ellis M. Kendle, M.D. i 1
Bile Acid Metabolism, Medical Problems
  Due to Disordered (H)
  John R. Senior, M.D. ii 41
Blue Shield's Partnership with Medicine,
  George Dunlop, M.D. iii 68
Book Reviews
  AMA Drug Evaluations,
  Harry F. Dowling, M.D. vii 202
  Medicines for Man,
  Harry F. Dowling, M.D. viii 223

C

Cancer, The Role of Viruses as a Possible
  Cause of Human (H)
  Frederick C. Robbins, M.D. ii 44
Carbenicillin, Clinical Experience with Oral
  William A. Taylor, M.D.
  (William J. Holloway, M.D.) xi 381
Carbenicillin, Metabolism and Laboratory
  Studies with Indanyl
  Kenneth Butler, M.D. xi 366
Cardiovascular Fitness, Testing and
  Developing (H)
  Lt. Col. Kenneth H. Cooper,
  USAF (MC) i 16
Cephapirin: Clinical, Pharmacological,
  and Microbiological Studies,
  Simon Jameson, M.D.
  (Martin C. McHenry, M.D.
  Thomas L. Gavan, M.D.
  Ray A. VanOmmen, M.D.
  Donald G. Vidt, M.D.
  Diane A. Butler, B.S.) xi 384
Clindamycin in the Treatment of Infections,
  Parenteral
  Christopher R. Donoho, Jr., M.D. xi 391
Clinical Medicine and the Community
  Hospital, The Teaching of (SR)
  Frank D. Gray, Jr., M.D. x 273
Colorectal Cancer (H)
  G. S. Serino, M.D. i 18
Community Hospital Outpatient Department,
  A Visual Screening Program in a
  Alvin Weiner, M.D. vii 199
Community Medicine and the Inner City,
  Patrick B. Storey, M.D. x 265
Conversion Hysteria — A Medical
  Emergency (H)

X72-2958

  Harold Stevens, M.D., Ph.D. iii 76
CPC, Wilmington Medical Center — Fatal Congestive Failure Following Afebrile Illness in a 59-Year-Old Woman, Patrick F. Ashley, M.D. (Alfred E. Bacon, Jr., M.D.) v 130
Cytomegalovirus Mononucleosis, Gerald L. Mandel, M.D. vi 155

D

Deaths
  J. Richard Durham, M.D. iii 83
  James M. Chase, M.D. iii 83
  Sylvester W. Rennie, M.D. iii 83
  Richard H. Price, M.D. viii 224
  Caleb H. Smith, M.D. viii 224
  William Marshall, Jr., M.D. x 275
  John F. Hynes, M.D. x 275
Delaware Academy of General Practice
  Flash! ii 54
  The Demise of the DAGP iii 81
  Concern, William H. Duncan, M.D. iv 114
  Medicine By Decree, Jack Gelb, M.D. v 142
  Florida Site for Assembly This Year vi 171
  The Commissioner of Food and Drugs Replies vii 204
  Legislative Notes viii 230
  Blues Appeal to Physicians to Help Curb High Utilization ix 252
  Montana Doctor Takes Helm x 286
  Psychiatric Seminars xii 434
Delaware Medical Journal, Statement of Ownership, Management and Circulation x 285
Designing a Modern Hospital: A Physician's Point of View, Burton A. Waisbren, M.D. iv 102
Doxycycline, Preliminary Report on Intravenous William J. Holloway, M.D. xi 394

E

Early Delaware Physicians: William Thornton, Harriet Durham viii 229
Editorials
  Pre-Hospital Coronary Care in Downstate Delaware i 19
  Plumb Unexpected: New Source of Lead Poisoning i 19
  Is All Quiet on the Western Front? i 20
  Carbenicillin ii 45
  Some Thoughts on Medicine in 1971, William J. Vandervort, M.D. ii 46
  A Case Against a Parasitic Hospital ii 48
  Genetic Causes of Pediatric Deaths ii 49
  Another Lapel Button ii 50
  Preventive Medicine: An End to Lip Service, Harold S. Rafal, M.D. iii 79
  Last Entry: J. R. Durham's Memo Book iii 80
  A New Penicillin iii 80
  Money Talk iv 109
  Cephalexin iv 109
  Blue Shield's Partnership with Medicine? William O. LaMotte, Jr., M.D. iv 111
  Responsible Physicians' Response to Irresponsible Press v 140
  Sickle Cell Hemoglobin: A Challenge to the Clinician and the Researcher, Roger B. Thomas, Jr., M.D. v 140
  Doctors' Helpers v 141
  The Cry of the Super-Human vi 167
  A Phone Message to Doctors vi 168
  Where the Doctors Are: Delaware vi 168
  The Role of the State Service Center, Jack Gelb, M.D. vii 201
  Treatment of Hyperlipidemias, William A. Taylor, M.D. vii 201
  An Ounce of Prevention vii 201
  What Health Care Costs? Harold S. Rafal, M.D. viii 225
  The Coronary Care Unit, William F. Renzulli, M.D. viii 225
  Botulism viii 226
  SMAC and Northeast: A List of Names viii 227
  Everything You Ought to Know About Sex viii 228
  The Private Patient and the Surgical Resident, Harry S. Rafal, M.D. ix 254
  Where Do We Go from Here? William O. LaMotte, Jr., M.D. ix 255
  Recurrent Viral Infection: An Annotation ix 257
  Mass Immunization Against Rubella: For Better or Worse? ix 258
  My Cup Runneth Over x 281
  Reevaluating Practice Habits: Cystoscopy x 281
  Cleaning Medical Records with S-O-A-P x 282
  Of Carts, Horses, and ER Visits x 283
  Rifampin x 284
  Prayer Breakfast xii 432
  Spectinomycin xii 432
Education, Higher, and the Nation's Health—Policies for Medical and Dental Education (SR) Clifford Foster iii 72
Exercise Prescription for Middle-Aged Persons (H) James S. Skinner, Ph.D. i 7

F

Fever of Unknown Etiology, Donald B. Louria, M.D. xi 343
Forum, The: Environment and Health Delaware Interagency Council on

Smoking and Health,
  Arthur R. VandePoele i 32
Air Pollution Is ...,
  N. A. Esmen, Ph.D. ii 60
Sociological Factors in Pollution,
  Jere Hoover iii 90
The Physician and Air Pollution: I,
  Arthur R. VandePoele iv 119
The Physician and Air Pollution: II,
  Arthur R. VandePoele v 148A
Women and Cigarette Smoking
  Dolores V. Antoine vi 176
Wilmington Rat Control Program,
  Louella Metzger vii 208A
Rabies,
  Louella Metzger viii 236A
An Open Letter: It's All Yours,
  Richard R. Griffith ix 264A
Statement by the Delaware Tuberculosis
  and Health Society x 292
Environmental Health
  Frank T. O'Brien, M.D. xii 444A
Fungal Infections, Increasing Incidence of
  Eileen L. Randall, Ph.D. xi 337

H

Health Care Programs, President Nixon
  Requests Assistance of Medical Profession
  in Developing (SR)
  Herbert M. Baganz, M.D. iii 75
Health Legislation of Interest to
  Medical Society of Delaware vii 196
Health Needs of Children in Delaware:
  A Report Prepared for the White House
  Conference on Children (SR)
  Marjorie J. McKusick, M.D. vi 160
Hepatic Abscess, Recent Trends in
  the Management of
  William A. Altemeier, M.D. xi 327
Heroin Addiction, Methadone Maintenance
  Treatment of
  Emmett P. Davis, M.D. ix 248
Hospital: Designing A Modern,
  A Physician's Point of View,
  Burton A. Waisbren, M.D. iv 102
Hyperalimentations, Long-Term
  Intravenous
  Stanley J. Dudrick, M.D. vi 149

I

Inner City, Community Medicine and the
  Patrick B. Storey, M.D. x 265
In the Vanguard (H)
  Albert L. Ingram, Jr., M.D. v 129

K

Kidney Transplantation:
  A Progress Report (H)
  Lee W. Henderson, M.D. x 276
Knee Joint, Arthroscopy of the (H)
  S. Ward Casscells, M.D. iv 107

L

Labor in the Field of Medical Care Delivery
  and Financing, The Expectations of
  Thomas J. Moore, Jr. x 271
Legislation, Health, of Interest to
  Medical Society of Delaware vii 196
Legislation, Recently Passed Delaware viii 230
Letters to the Editor
  Richard L. Day, M.D. ii 52
  Charles M. Bancroft, M.D. ii 52
  A. Roke Lieberman ii 53
  David Platt, M.D. ii 53
  Gordon Keppel, M.D. iii 82
  Kline G. Kemp, Jr. iii 82
  Richard R. Griffith iv 101
  J. W. Abbiss, M.D., et al v 139
  Marjorie J. McKusick, M.D. vi 169
  Daniel J. Preston, M.D. vi 169
  I. J. Tikellis, M.D. vii 203
  Charles L. Minor, M.D. ix 251
  Rhoslyn, Bishoff, M.D. xii 431

M

Medical Care Delivery and Financing, The
  Expectations of Labor in the Field of
  Thomas J. Moore, Jr. x 271
Medical Care, The San Joaquin
  Foundation for
  Donald C. Harrington, M.D. viii 216
Medical Education, Annual Congress on (SR)
  E. Wayne Martz, M.D. viii 220
Medical Education, The Role of the
  Surgeon in
    Gordon F. Schwartz, M.D. ix 241
Medical Records, Automating (H)
  Capt. Charles S. Burger, MC v 127
Medical Society of Delaware,
  Proceedings of the House of Delegates,
  1970, Resolutions i 21
  Committees, 1970-1971 i 26
  Guidelines Established by the Peer Review
  and Professional Evaluation Committee ii 55
  182nd Annual Meeting, Application for
    Scientific Exhibit III 89, iv 120
    iv 120
  182nd Annual Meeting, Application for
    Art Exhibit v 148
  Health Legislation of Interest to vii 196
  Annual Meeting Program, 1971 ix 237
  Charter and By-Laws ix Insert
  Officers, 1900-1971 ix 253
  Proceedings of the House of Delegates xii 405
Medicine Today,
  Walter C. Bornemeier, M.D. ii 33
Metabolism and Laboratory Studies with
  Indanyl Carbenicillin,
  Kenneth Butler, M.D. xi 366

Methadone Maintenance Treatment of
  Heroin Addiction,
  Emmett P. Davis, M.D. ix 248
Minors, House Bill No. 377 vii 195
Mushroom Toxins, The
  Donald M. Simons, Ph.D. vii 177
Myocardial Infarction, Arrhythmias in
  Roman W. DeSanctis, M.D. viii 209

N

New Members
  William V. Whitehorn, M.D.
  Vincent DelDuca, Jr., M.D.
  Leo B. Hogan, Jr., M.D.
  Anthony L. Cucuzzella, M.D. vi 172
  David S. Howard, M.D.
  M. Cornelius Hoffman, M.D.
  George P. Liarakos, M.D.
  Nejat M. Tajen, M.D. viii 232
  Richard P. Behrendt, M.D.
  James F. Reamer, M.D.
  Herman J. Stein, M.D.
  Jurg A. Schneider, M.D. x 287
New Patients Welcome! (But Do They
  Know It?)
  Wilburn L. McClure, Jr. v 144

O

Oxolinic Acid, Treatment of Urinary Tract
  Infections with
  K. Mohring, M.D.
  (Paul O. Madsen, M.D.) xi 376

P

Parenteral Clindamycin in the Treatment
  of Infections,
  Christopher R. Donoho, Jr., M.D. xi 391
Peripheral Arterial Disease, Treatment
  of (H)
  David Naide, M.D. viii 221
Pneumoconiosis, Coal Workers'
  Peter R. Graze, M.D. xii 401
President's Page
  A Memo From the President i 25
  The National Prayer Breakfast ii 51
  Brighter Horizons for Mental Health iii 78
  No RMP For Delaware? iv 113
  Professional Ideals v 143
  The Community Physician vi 170
  A Substitute for the Community
    Physician xii 205
  A Matter for Your Personal Attention viii 231
  Pharmacy and Medicine: A Point of View ix 260
  Changing Patterns of Medical Practice x 279
  Planning Our Resources xi 398
  Our Continuing Education xii 433
Prevention and Treatment of Respiratory
  Viral Infections in Children,
  Stanley W. Williams, M.D. xi 315
Propranolol, Review of Beta-Adrenergic
  Blocking Agent,
  Ellis M. Kendle, M.D. i 1
Pros and Cons of Automated Test Groups,
  Ralph E. Thiers, Ph.D.
  (Orville J. Golub, Ph.D.) ii 38

R

Recent Advances in Tumor Immunology,
  Irwin L. Stoloff, M.D. v 121
Recent Trends in the Management of
  Hepatic Abscess,
  William A. Altemeier, M.D. xi 327
Recovery from Acute Infection,
  Leighton E. Cluff, M.D. xi 349
Regional Medical Program, Delaware and
  Edgar Hare, Jr. vii 191
Respiratory Viral Infections in Children,
  Prevention and Treatment of
  Stanley W. Williams, M.D. xi 315
Role of Viruses as a Possible Cause of
  Human Cancer, The (H)
  Frederick C. Robbins, M.D. ii 44

S

San Joaquin Foundation for Medical
  Care, The
  Donald C. Harrington, M.D. viii 216
Sickle Cell Disease (H)
  Thomas G. Gabuzda, M.D. v 124
Surgeon in Medical Education, The Role
  of The
  Gordon F. Schwartz, M.D. ix 241
Surgical Management of Motility
  Disturbances of the Esophagus and Cardia,
  F. Henry Ellis, Jr., M.D., Ph.D. iii 61

T

Teaching of Clinical Medicine and the
  Community Hospital, The (SR)
  Frank D. Gray, Jr., M.D. x 273
Therapy, Initial, of Serious Bacterial
  Infections,
  Christopher M. Martin, M.D. iv 91
Tuberculosis and Mycobacterial Pulmonary
  Disease, The Treatment of
  J. Woodrow Savacool, M.D. xi 320
Tumor Immunology, Recent Advances in
  Irwin L. Stoloff, M.D. v 121

U

Ultrasound as an Aid in the Diagnosis and
  Management of Intermittent
  Claudication (H)
  Richard Lennihan, Jr., M.D.
  (Martha Mackereth, R.N.) vi 157
Urinary Infection in Females, The Diagnosis
  and Management of
  Allan R. Ronald, M.D. xi 361

Urinary Tract Infection, Differentiation of Upper from Lower
  Marvin Turck, M.D. xi 356
Urinary Tract Infections with Oxolinic Acid, Treatment of
  K. Mohring, M.D. (Paul O. Madsen, M.D.) xi 376

V

Visual Screening Program in a Community Hospital Outpatient Department, A
  Alvin Weiner, M.D. vii 199

DELAWARE MEDICAL JOURNAL

AUTHORS

INDEX — PART 2

Volume 43 January-December 1971

A

Abbiss, J. W., M.D., et al,
  Letter to the Editor v 139
Altemeier, William A., M.D.,
  Recent Trends in the Management of Hepatic Abscess xi 327
Antoine, Dolores V.,
  Women and Cigarette Smoking (The Forum) vi 176
Ashley, Patrick F., M.D.
  (Alfred E. Bacon, Jr., M.D.)
  CPC, Wilmington Medical Center— Fatal Congestive Failure Following Afebrile Illness in a 59-Year-Old Woman v 130

B

Baganz, Herbert M., M.D. x 278
  President Nixon Requests Assistance of Medical Profession in Developing Health Care Programs (SR) iii 75
  President's Page
    Changing Patterns of Medical Practice x 279
    Planning Our Resources xi 398
    Our Continuing Education xii 433
Bancroft, Charles M., M.D.
  Letter to the Editor ii 52
Bishoff, Rhoslyn J., M.D.
  President's Page
    A Memo From The President i 25
    The National Prayer Breakfast ii 51
    Brighter Horizons for Mental Health iii 78
    No RMP For Delaware? iv 113
    Professional Ideals v 143
    The Community Physician vi 170
    A Substitute for the Community Physician vii 205
    A Matter for Your Personal Attention vii 231
    Pharmacy and Medicine: A Point of View ix 260
  Letter to the Editor xii 431
Bornemeier, Walter C., M.D.,
  Medicine Today ii 33
Brass, Alister, M.A., B.M., B.Ch.,
  Medicine in Australia Today iv 94
Burger, Capt. Charles S., MC,
  Automating Medical Records (H) v 127
Butler, Kenneth, M.D.,
  Metabolism and Laboratory Studies with Indanyl Carbenicillin xi 366

C

Casscells, S. Ward, M.D.,
  Arthroscopy of the Knee Joint (H) iv 107
Cluff, Leighton E., M.D.
  Recovery from Acute Infection xi 349
Cooper, Lt. Col. Kenneth H., USAF (MC),
  Testing and Developing Cardiovascular Fitness (H) i 16

D

Davis, Emmett P., M.D.,
  Methadone Maintenance Treatment of Heroin Addiction ix 248
Day, Richard L., M.D.,
  Letter to the Editor ii 52
DeSanctis, Roman W., M.D.,
  Arrhythmias in Myocardial Infarction viii 209
Donoho, Christopher R., Jr., M.D.,
  Parenteral Clindamycin in the Treatment of Infections xi 391
Dowling, Harry F., M.D.,
  Book Review: AMA Drug Evaluations vii 202
  Book Review: Medicines for Man viii 223
Dudrick, Stanley J., M.D.,
  Long-Term Intravenous Hyperalimentation vi 149
Duncan, William H., M.D.,
  Concern iv 114
Dunlop, George, M.D.,
  Blue Shield's Partnership with Medicine iii 68

Durham, Harriet
  Early Delaware Physicians: William Thornton viii 229

E

Ellis, F. Henry, Jr., M.D.,
  Surgical Management of Motility Disturbances of the Esophagus and Cardia iii 61
Esmen, N. A., Ph.D.,
  Air Pollution Is . . . (The Forum) ii 60

F

Finland, Maxwell, M.D.,
  Antibiotic Combinations xi 296
Foster, Clifford,
  Higher Education and the Nation's Health (SR) iii 72

G

Gabuzda, Thomas G., M.D.,
  Sickle Cell Disease (H) v 124
Gelb, Jack, M.D.,
  Medicine By Decree v 142
  The Role of the State Service Center vii 200
Gliwa, Edward F., M.D.,
  Letter to the Editor x 286
Gray, Frank D. Jr., M.D.,
  The Teaching of Clinical Medicine and the Community Hospital (SR) x 273
Graze, Peter R., M.D.
  Coal Workers' Pneumoconiosis xii 401
Griffith, Richard R.,
  Letter to the Editor iv 101
  An Open Letter: It's All Yours (The Forum) ix 264A

H

Hare, Edgar, Jr.,
  Delaware and the Regional Medical Program vii 191
Harrington, Donald C., M.D.,
  The San Joaquin Foundation for Medical Care viii 216
Henderson, Lee W., M.D.,
  Kidney Transplantation: A Progress Report (H) x 276
Holloway, William J., M.D.,
  Introductory Remarks to the Eighth Annual Infectious Disease Symposium xi 293
  Clinical Experience with Oral Carbenicillin (William A. Taylor, M.D.) xi 381
  Preliminary Report on Intravenous Doxycycline xi 394
Hoover, Jere,
  Sociological Factors in Pollution (The Forum) iii 90

I

Ingram, Albert L., Jr., M.D.,
  In the Vanguard (H) v 129

J

Jameson, Simon, M.D.,
  (Martin C. McHenry, M.D., Thomas L. Gavan, M.D., Ray A. VanOmmen, M.D., Donald G. Vidt, M.D., Diane A. Butler, B.S.)
  Cephapirin: Clinical, Pharmacological, and Microbiological Studies xi 384

K

Kemp, Kline G., Jr.,
  Letter to the Editor iii 82
Kendle, Ellis M., M.D.,
  Review of Beta-Adrenergic Blocking Agent (Propranolol) i 1
Keppel, Gordon, M.D.,
  Letter to the Editor iii 82

L

LaMotte, William O., Jr., M.D.
  Blue Shield's Partnership with Medicine? iv 111
  Where Do We Go from Here? ix 255
Lennihan, Richard, Jr., M.D.,
  (Martha Mackereth, R.N.)
  Ultrasound as an Aid in the Diagnosis and Management of Intermittent Claudication (H) vi 157
Lieberman, A. Roke,
  Letter to the Editor ii 53
Louria, Donald B., M.D.,
  Fever of Unknown Etiology xi 343

M

Mandel, Gerald L., M.D.,
  Cytomegalovirus Mononucleosis vi 155
Martin, Christopher M., M.D.,
  Initial Therapy of Serious Bacterial Infections iv 91
Martz, E. Wayne, M.D.,
  Annual Congress on Medical Education (SR) viii 220
McClure, Wilburn L., Jr.,
  New Patients Welcome! (But Do They Know It?) v 144
McKusick, Marjorie J., M.D.,
  Health Needs of Children in Delaware: A Report Prepared for the White House Conference on Children (SR) vi 160
  Letter to the Editor vi 169
Metzger, Louella,
  Wilmington Rat Control Program (The Forum) vii 208A
  Rabies (The Forum) viii 236A
Minor, Charles L., M.D.,
  Letter to the Editor ix 251

Mohring, K., M.D.,
(Paul O. Madsen, M.D.)
Treatment of Urinary Tract Infections with Oxolinic Acid xi 376
Moore, Thomas J., Jr.
The Expectations of Labor in the Field of Medical Care Delivery and Financing x 271

N

Naide, David, M.D.,
Treatment of Peripheral Arterial Disease (H) viii 221

O

O'Brien, Frank T., M.D.
Environmental Health (The Forum) vii 444A

P

Platt, David, M.D.,
Letter to the Editor ii 53
Preston, Daniel J., M.D.,
Letter to the Editor vi 169

R

Rafal, Harold S., M.D.,
Preventive Medicine: An End to Lip Service iii 79
What Health Care Costs? viii 225
The Private Patient and the Surgical Resident ix 254
Randall, Eileen L., Ph.D.,
Increasing Incidence of Fungal Infections xi 337
Renzulli, William F., M.D.,
The Coronary Care Unit viii 225
Robbins, Frederick C., M.D.,
The Role of Viruses as a Possible Cause of Human Cancer (H) ii 44
Ronald, Allan R., M.D.,
Antimicrobial Susceptibility Testing—Its Value and Limitations in Medical Practice xi 308
The Diagnosis and Management of Urinary Infection in Females xi 361

S

Savacool, J. Woodrow, M.D.,
The Treatment of Tuberculosis and Mycobacterial Pulmonary Disease xi 320
Schwartz, Gordon F., M.D.,
The Role of the Surgeon in Medical Education ix 241
Senior, John R., M.D.,
Medical Problems Due to Disordered Bile Acid Metabolism (H) ii 41
Serino, G. S., M.D.,
Colorectal Cancer i 18
Simons, Donald M., Ph.D.,
The Mushroom Toxins vii 177
Skinner, James S., Ph.D.,
Exercise Prescription for Middle-Aged Persons (H) i 7
Stevens, Harold, M.D., Ph.D.,
Conversion Hysteria — A Medical Emergency (H) iii 76
Stoeckle, John D., M.D.,
An Overview of Ambulatory Medicine, Outpatient Services and Medical Practices (H) iv 108
Stoloff, Irwin L., M.D.,
Recent Advances in Tumor Immunology v 121
Storey, Patrick B., M.D.,
Community Medicine and the Inner City x 265

T

Taylor, William A., M.D.,
(William J. Holloway, M.D.)
Carbenicillin ii 45
Treatment of Hyperlipidemias vii 201
Clinical Experience with Oral Carbenicillin xi 381
Thiers, Ralph E., Ph.D.,
(Orville J. Golub, Ph.D.)
The Pros and Cons of Automated Test Groups ii 38
Thomas, Roger B., Jr., M.D.,
Sickle Cell Hemoglobin: A Challenge to the Clinician and the Researcher v 140
Tikellis, I. J., M. D.,
Letter to the Editor vii 203
Turck, Marvin, M.D.,
Complications of Antimicrobial Therapy xi 302
Differentiation of Upper from Lower Urinary Tract Infection xi 356

V

VandePoele, Arthur R.,
Delaware Interagency Council on Smoking and Health (The Forum) i 32
The Physician and Air Pollution: I (The Forum) iv 119
The Physician and Air Pollution: II (The Forum) v 148A
Vandervort, William J., M.D.,
Some Thoughts on Medicine in 1971 ii 46

W

Waisbren, Burton A., M.D.,
Designing a Modern Hospital: A Physician's Point of View iv 102
Weiner, Alvin, M.D.,
A Visual Screening Program in a Community Hospital Outpatient Department vii 199
Wiener, Leslie, M.D.,
Atherosclerosis: A Discussion of Factors in Cause and Treatment vii 188
Williams, Stanley W., M.D.,
Prevention and Treatment of Respiratory Viral Infections in Children xi 315

Delaware Medical Journal

JANUARY, 1971
VOLUME 43
NUMBER 1

REVIEW OF BETA-ADRENERGIC BLOCKING AGENT (Propranolol)

• **This review is intended to acquaint practicing physicians with propranolol's manifold actions. Propranolol is currently approved by the Food and Drug Administration for three indications: cardiac arrhythmias, hypertrophic subaortic stenosis, and pheochromocytoma. There is much to be learned regarding its clinical application.**

Ellis M. Kendle, M.D.

The introduction of beta-adrenergic receptor blocking agents into clinical medicine represents a significant therapeutic advance. Approximately 16 beta blocking compounds have been developed to this date. Before propranolol was put into clinical use, two other experimental beta-adrenergic blocking agents, dichloroisoproterenol (DCI) and pronethalol hydrochloride (nethalide) were in use but are no longer. The latter possessed significant anti-arrhythmic properties, but was discarded because it produced cancer in mice.[1] Dichloroisoproterenol, reported by Powell and Slater[2] in 1958, was also abandoned because of undesirable intrinsic sympathomimetic activity.[3]

The development of a new beta receptor antagonist, propranolol (Inderal—Ayerst), which is free from carcinogenic properties in mice[4] and has a much greater therapeutic ratio than pronethalol, became the prototype of beta blocking agents. At this writing, only the propranolol is available for clinical use in the United States. More recently several new beta-adrenergic receptor blocking agents have been introduced and now are under current investigation. Among them are Butoxamine (Burroughs-Wellcome) and Sotalol (Mead Johnson).[5] These two new drugs will be described briefly in this review.

It is the purpose of this review to acquaint practicing physicians with the basic physiology, pharmacology, uses, and possible hazards in prescribing the potent drug, propranolol.

Pharmacology

It was Ahlquist in 1948 who clearly defined the existence of two distinct types of adrenergic receptors and proposed the terms alpha- and beta-adrenergic receptors.[6] Epinephrine acts upon both alpha- and beta-adrenergic receptors and causes both vasoconstriction and vasodilatation. These effects of epinephrine upon the peripheral vascular bed clearly illustrate the existence of two types of receptor sites. Receptors which responded with vasoconstriction or excitatory

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effects were termed alpha-adrenergic receptors. If these receptors (alpha) were blocked by phenoxybenzamine, the beta-adrenergic effect predominates, ie, vasodilatation. Receptors which responded by producing vasodilatation or inhibition were termed beta-adrenergic. If these latter receptors are blocked by propranolol, vasoconstriction predominates because of alpha-adrenergic receptor activation.

According to current concepts the peripheral arterial system contains both alpha- and beta-adrenergic receptors. Stimulation of beta receptors in skeletal muscle arterioles by isoproterenol results primarily in vasodilatation, whereas stimulation of the alpha-adrenergic receptors in arterioles by methoxamine results in vasoconstriction in most vascular beds. In the heart, only beta-adrenergic receptors have been proven to be present in the myocardium[7], but both alpha- and beta-adrenergic receptors are thought to be present in the coronary arterial tree.[8]

Stimulation Effects

It is believed that upon stimulation beta-adrenergic receptors will produce marked metabolic effects such as lipolysis in adipose tissue and glycogenolysis.[9,10] Sutherland[11] has demonstrated that glycogenolysis is dependent upon the conversion of the enzyme phosphorylase to its active form. Cyclic 3′5′ AMP (cyclic 3′5′ adenosine monophosphate) appears to play a prominent role in mediating the lipolytic action of catecholamines[12,13] by similarly leading to glycogenolysis.

On the basis of available evidence it is not possible at the present time to classify the adrenergic receptors which mediate the hepatic glycogenolytic effects of the catecholamines as alpha- or beta- since hyperglycemia induced by the catecholamines is quite different and metabolic responses have not correlated well with either alpha- or beta-blockade.[10]

To understand the pharmacology of beta-adrenergic receptors, it is worthwhile to emphasize the effects of beta-adrenergic stimulation on the heart. Isoproterenol (Isuprel—Winthrop), a pure beta receptor stimulator, decreases the duration of systolic ejection, and increases end-systolic and end-diastolic ventricular volumes. Isoproterenol increases myocardial contractility and venous return and therefore increases the cardiac output. There is associated tachycardia, and the mean arterial pressure decreases as a result of vasodilatation in peripheral circulation. Pitt, Elliot, and Gregg[14] in their recent work demonstrated that isoproterenol may also stimulate beta receptors in the coronary arteries, resulting in vasodilatation of the coronary circulation. In addition, the conduction velocity of the A-V nodal tissue is increased while its refractory period is shortened.

Physiological Changes

Beta-adrenergic receptor blockade mentioned in the previous paragraph and exemplified by propranolol produces physiological changes that are the reverse of the action of isoproterenol (beta-adrenergic receptor stimulator). Other known properties of propranolol are its quinidine-like effects and its effects similar to local anesthetics such as procaine or lidocaine.[15] According to Gibson and Sowton,[16,17] the term quinidine-like effect is not an ideal description since propranolol differs from quinidine in shortening the action potential because of a reduction of early diastolic repolarization, whereas quinidine lengthens all phases of the action potential. The most important effects of propranolol include a negative ionotrophic effect on the heart, ie, diminution in cardiac contractility, slowing of the heart rate, and antiarrhythmic effects. With reduced stroke volume, cardiac output is therefore diminished, and the subsequent reduction in left ventricular work results in reduction of oxygen consumption.[18] Parratt[19] has demonstrated that coronary blood flow decreased as much as 20-30% after the administration of propranolol which led others to believe that this drug might be dangerous to patients with ischemic heart disease. The study done by Lewis and Brink[20] has shown that propranolol results in less than 10% decrease in myocardial oxygen consumption and coronary blood flow. Propranolol seems to reduce the need of the myocardium for oxygen, and this reduction in myocardial oxygen requirements may cause an increase in coronary vascular resistance and decrease in coronary blood flow.[21-23]

It now appears that there is no convincing evidence in conscious man or animals that propranolol reduces coronary blood flow out of proportion to the reduction in myocardial oxygen consumption.

Uses of Beta-Adrenergic Blockade (Propranolol)

1. Idiopathic Hypertrophic Subaortic Stenosis: This is probably the only condition in which propranolol is widely accepted as the drug of choice.[24,25] Isoproterenol, which exerts a positive ionotrophic effect when infused in patients with idiopathic hypertrophic subaortic stenosis, increases the systolic pressure gradient across the outflow tract of the left ventricle and decreases the effective size of the outflow orifice.[26] These effects have been noted with exercise or emotional excitation.[27] In some cases with obstructive cardiomyopathies, it has been demonstrated that the resected abnormal tissue showed proliferation of sympathetic nerve fibers and increased content of norepinephrine.[28] Lucchesi et al[10] have further demonstrated the significant role played by the sympathetic nervous system in the physiologic derangements in patients with idiopathic subaortic stenosis.

In order to prevent the pathophysiologic effects of augmented sympathetic nerve discharge as discussed in the preceding paragraph, the beta-adrenergic receptor blocking agents, such as propranolol, are useful in the treatment of idiopathic hypertrophic subaortic stenosis. In idiopathic hypertrophic subaortic stenosis 10 of 13 patients were subjectively improved with propranolol. Effort tolerance improved in seven out of nine, and syncope was prevented in five patients out of six.[29] Cohen and Braunwald have reported amelioration of angina pectoris in patients with idiopathic hypertrophic subaortic stenosis following the administration of propranolol.[25] Following beta-adrenergic blockage in these patients there are decrease in obstruction of the left ventricular outflow tract and increase in cardiac volume as a result of bradycardia. The reduction in cardiac work may also prevent angina pectoris.

In summary, when propranolol was utilized in patients with idiopathic hypertrophic subaortic stenosis, it was found to produce subjective improvement with improved exercise tolerance, less dysrhythmias, and less severe dyspnea.

2. Pheochromocytoma: One other group in which this drug has been used is patients with catecholamine secreting tumors. One-half percent of all hypertension is thought to be due to pheochromocytomas.[30-32] This one-half percent is important because this is a completely curable condition by surgical removal of the tumor. The advent of an alpha receptor blocking drug was a valuable advance in the surgical management of patients with pheochromocytoma, enabling the blood pressure to be controlled during the operation.

Phentolamine (Regitine—CIBA), an alpha-adrenergic blocking drug, has too short a period of action for its effective use during operation, and phenoxybenzamine (dibenzyline) with its longer period of action has proved much more effective for this purpose.[33] Brunjes and associates[34] found that patients with pheochromocytoma have hypovolemia secondary to constriction of small vessels. Administration of phenoxybenzamine before the operation permits reexpansion of the circulation and eliminates the necessity of postoperative infusions of norepinephrine.[35] Use of phenoxybenzamine in preoperative preparation of patients with pheochromocytoma often leads to a moderate tachycardia attributed to uncovering the beta stimulant effect of norepinephrine when the alpha vasoconstrictor effect is blocked. The administration of a beta-adrenergic blocking agent such as propranolol will prevent this rise of pulse rate. It also protects the myocardium from the arrhythmias produced by hydrocarbon anesthetics especially if atropine has been given for premedication.[36,37]

From the above statement it is clearly shown that a program of combined alpha and beta receptor blockade is recommended for the preoperative and operative management of surgical removal of pheochromocytoma.[33] With this regime, there is less likelihood of hypertensive and hypotensive crises and death from ventricular arrhythmias. One of the disadvantages of the combined alpha and beta receptor blockade administration during the operation is the masking of the cardinal signs of blood loss and overtransfusion. Shock may occur without an increase in pulse rate since the circulation is fully expanded and compensatory vasoconstrictor reflexes have been blocked.

Dollery and associates[38] suggest that the routine use of propranolol in preoperative preparation of patients with pheochromocytoma is probably unnecessary though it is wise to have the drug available during surgery to counteract serious cardiac arrhythmias.

3. Arrhvthmias: The current status of propranolol as an anti-arrhythmic agent is now well established, but it should probably be considered a second line drug because its therapeutic spectrum overlaps that of digitalis.

Propranolol Influences

The supraventricular arrhythmias are more consistently influenced by propranolol as are ventricular arrhythmias.[39] The drug shows a rather high degree of specificity in antagonizing paroxysmal atrial tachycardia with block, ventricular premature beats, and ventricular tachycardia due to digitalis intoxication secondary to increased automaticity, whereas it aggravates arrhythmias due to depressed atrioventricular conduction. The mechanism of action in this situation is not entirely clear.[5] However, Hoffman and Singer[40,41] have postulated that the production of pacemaker activity in Purkinje tissue induced by cardiac glycosides may increase the rate of spontaneous diastolic depolarization, and when beta-adrenergic blockade agent is used, the diastolic depolarization is usually suppressed. The mechanism of propranolol's action on ventricular arrhythmias not associated with digitalis intoxication and supraventricular tachycardias may be related to reduction in the automaticity of the ectopic pacemaker.[42] In most patients with atrial fibrillation[43,44] and atrial flutter[44,45] the ventricular rate slows down a few minutes after administration of propranolol. The incidence of conversion to sinus rhythm appears to be highest in the immediate postoperative period when dysrhythmia is of recent onset.[45]

Wolff-Parkinson-White Syndrome associated with attacks of paroxysmal tachycardia has been described in the literature to respond fairly well to oral administration of propranolol.[46-49] Propranolol seems to cause both antegrade and retrograde block at the A-V junction, preventing reentry mechanisms.[7]

Incidence of Arrhythmias

Prophylactic administration of propranolol was of no value in reducing the incidence of arrhythmias after acute myocardial infarction.[50] Although propranolol is effective in eliminating occasional ventricular dysrhythmias associated with myocardial infarction, the risk of precipitating congestive heart failure in this situation suggests extra caution in its use.[39,51] In his study, Snow[52] showed a significant decrease in mortality rate of patients receiving oral propranolol when compared with those not receiving the drug. However, subsequent studies have not borne out these results.

In general, propranolol is not the primary drug of choice in the treatment of arrhythmias. It may be considered beneficial only in the treatment of arrhythmias which have proved refractory to other drugs.

4. Angina Pectoris: Several investigators[23,53-58] have found that propranolol is effective in alleviating angina pectoris. The mechanism by which propranolol affects angina pectoris is not completely understood. The effects of this drug on coronary blood flow and on myocardial oxygen delivery have been studied by several investigators. Parratt and Grayson[59] postulated that the vasoconstriction observed following beta-adrenergic receptor blockade results from unopposed stimulation of alpha receptors. The improvement in angina pectoris following propranolol administration is best accounted for on the basis of arterial pressure, the velocity of myocardial contraction and reduction of heart rate. Such a reduction of oxygen needs of the heart may cause an increase in coronary vascular resistance and decrease in coronary blood flow.[21]

Distribution of Coronary Blood Flow

During stress, as a result of stimulation of beta-adrenergic receptor, the distribution of coronary blood flow is from endocardium to epicardium, thereby rendering the endocardium ischemic.[7] By giving propranolol, there is an increase in subendocardial flow,[60] a mechanism which can explain part of its beneficial effect in angina pectoris by preventing the subendocardial ischemia during stress. The study of Gillam and Prichard[61] pointed out that the dose of propranolol which produces maximal benefit varies and must be adjusted for each individual patient. Most investigators[61-63] generally agree that the recommended dose for angina is greater than that for antiarrhythmic effect though the smallest effective dose should be used as there is no advantage in slowing the heart unduly. It is further recommended that propranolol should be used only in patients whose myocardial function is relatively sound.[24] Propranolol should not be used in patients who are suffering from heart failure, overt or impending, or in heart block, because of the blockade of the sympathetic drive. On the other hand, if propranolol is required for relief of angina pectoris, it may usually be used despite the presence of mild congestive heart failure in patients who are hemodynamically compensated through the concurrent use of digitalis and diuretic therapy.

The combination of propranolol and nitrate might act synergistically on the distribution of coronary blood flow.[64,65] However, Aronow and Kaplan[66] contend that the propranolol-isosorbide combination in the treatment of patients with angina pectoris may harm as well as benefit the patient. The variation in the results of the clinical trials obviously lends support that further studies are indicated. Propranolol has not yet been approved by the Federal Food and Drug Administration for use in angina pectoris.

5. Hypertension: Prichard has reported that the beta-adrenergic blocking drug (pronethalol) has hypotensive effect[67] which was subsequently confirmed from the work of Prichard and Gillam[68] using propranolol. Richard[69] has studied nine hypertensive patients using oral administration of propranolol longer than 10 to 20 weeks; mean diastolic pressures fell an average of 12 mm/Hg in all nine patients.

The antihypertensive effect is not manifested on short term oral therapy or after intravenous administration; however, hypotensive effect is noted after long-term oral therapy in doses of 150 or 300 mg a day over a period of 8 to 15 weeks.[68,69] The mechanism of propranolol's hypotensive effect is still obscure. It has been postulated[67] that the hypotensive effect is achieved by blockading the sympathetics of the heart which are responsible for transient rises in blood pressure. More recent studies done by Frolich et al[70] have shown that the hypotensive action may be due to a reduction of cardiac output rather than reduction in peripheral vascular resistance as most common antihypertensive agents do.

6. Miscellaneous: Other reported uses of propranolol include Parkinson's tremor, [71,72] hyperthyroidism,[73] hyperkinetic heart syndrome,[74] and tetralogy of Fallot.[75]

Two new antagonists to adrenergic beta receptors have recently emerged. Sotalol (MJ 1999), one of the new beta blockers, has been known for four years, and it has been found to be effective in animals but its clinical value is still undetermined. It is known that this compound has no membrane activity or intrinsic sympathomimetic activity.[76,77] Butoxamine, a new compound under current investigation in USA, appears to be a specific antagonist of adrenergic beta receptors. It has been shown that it mediates lipolysis, peripheral vasodilation, and relaxation of the rat uterus.[78] This agent seems to act more on receptors in some tissues than in others.

Side Effects

True side effects of propranolol are minor, and most of them are infrequent and transient. In his study of two thousand patients, Stephen[79] revealed that the commonest side effects in the order of frequency are lightheadedness in 22, tiredness and drowsiness in 18, and nausea in 15. 1500 of his patients were treated orally and the remaining 500 by intravenous injection. In this same study, the most frequent pharmacological effects of propranolol by oral administration were cardiac failure in 13, dyspnea and wheezing in eight, and hypotension in eight patients. It was estimated that minor side effects occur in less than two percent of cases. Harris[48] reported one case of thrombocytopenic purpura and Stephen[79] reported two. The purpuric rashes cleared up when the drug was stopped.

Propranolol may precipitate frank congestive heart failure if administered to patients with significant underlying heart disease. In this condition, the drug may abolish sympathetic drive to the myocardium which may lead to an abrupt fall in cardiac output with subsequent hypotension.[37] It should never be used in patients receiving psychotrophic drugs, which are adrenergic in effect, such as the monomine oxidase inhibitors, since these drugs are known to deplete the circulating catecholamines and as a consequence may precipitate heart failure.

Bronchial asthma is another condition in which propranolol is contraindicated. The bronchospasm produced by propranolol in patients with asthma is due to an increase in airway resistance[80] secondary to unopposed bronchoconstrictor activity of the parasympathetic system or unopposed activity of the alpha sympathetic system. Propranolol should be used very cautiously in diabetic patients receiving insulin or oral hypoglycemic drugs, since this beta-adrenergic blocker may produce hypoglycemic reaction by preventing epinephrine induced glycogenolysis.

Isoproterenol and glucagon are the known antidotes for toxic side effects of propranolol. Isoproterenol should be given in appropriate doses in order to overcome all of the negative ionotrophic and chronotrophic effects of beta blocker. More recently, the hormone glucagon has been shown to have benefits in the presence of propranolol by augmenting cardiac contractility and heart rate.[81,82] However, if the toxic side effects of propranolol are sinus bradycardia or third degree heart block, glucagon would have no effect.

The characteristic absence of cardiac arrhythmias with glucagon renders it safe for use in patients with myocardial infarction.[83] It seems to offer advantage over isoproterenol, since the latter is known to enhance the automaticity of the heart. Parmley[84] and associates mentioned three specific clinical conditions when glucagon might be of value. These are toxicity from beta-adrenergic blockade, acute heart failure (cardiogenic shock), and post pump heart failure following cardiac surgery. The precise role played by glucagon is not entirely clear, since there are at present limited clinical data available.

Summary

Propranolol has been proven useful in clinical practice even though further experience is needed to define precisely the role of this agent in therapy of heart disease. It is of significant value in digitalis induced arrhythmias, idiopathic hypertrophic subaortic stenosis and in the management of pheochromocytoma. Caution and close observation of patients receiving propranolol are always necessary because removal of the sympathetic support to the failing heart may result in severe cardiac decompensation. It should be emphasized that propranolol does not appear to be a primary drug of choice in the management of arrhythmias. Contraindications include congestive heart failure, cardiogenic shock, bronchial asthma, sinus bradycardia, advanced heart block, and patients taking monamine oxidase inhibitor drugs.

Finally, propranolol must be used with full understanding of the consequences resulting from the inhibition of the beta-adrenergic receptors. As yet not all aspects of the action of propranolol are understood, but in time it is expected that more knowledge will be accumulated. Much remains to be learned regarding the clinical application of the new beta-adrenergic receptor blocking agents currently under investigation, since they are not available for routine use.

Owing to the length of Doctor Kendle's bibliography, it has not been published in the Journal with his review but is available on request.

Science has no country. *Pasteur*

EXERCISE PRESCRIPTION FOR MIDDLE-AGED PERSONS

• There is no one conditioning program which will be optimal for all persons or even for the same person over an extended period of time. Consideration of certain principles of exercise physiology should permit the physician to recommend individualized activities for each of his patients.

James S. Skinner, Ph.D.

The average, middle-aged American male is a good example of *Homo sedentariens.* Cunningham et al[1] have reported that while the majority of men in a typical US community spent more than one hour per week in active leisure, the intensity of their activities rarely exceeded a level eight times greater than the resting metabolism (ie, 8 Mets). The usual result of such inactivity is a decline in fitness. Many men accept this decline as the inevitable result of aging, while others may attempt to alter the situation. This latter group of men who have decided to become more active often consult their physicians for recommendations on the amount and type of activities which they should do.

In order to prescribe activities, the physician should have a basic knowledge of how exercise intensity is measured, how different types of exercise should be described, and what effects, both acute and chronic, exercise will have on various physiological systems. He should be familiar with the basic principles of exercise physiology and physical conditioning so that he can prescribe an individual program for each of his patients.

Basic Information Needed by the Physician

For a better ability to prescribe exercise, a pharmacopoeia of activity is needed. Although it may be useful to know the calories expended doing various activities, this expenditure is affected by body size. (Figure 1) Differences in body weight are allowed for by stating requirement in terms of Mets, or multiples of the resting metabolic rate (1 Met is approximately 3.5 cc/kg·min of oxygen consumed). Thus, in an absolute sense, the larger man expends more calories walking at 3 mph (4.2 kcal for 80 kg man vs. 2.6 kcal for the 50 kg man). However, since the larger man also expends proportionately more calories at rest, relative to their resting metabolic rates both men are working at an intensity of 3 Mets. Examples of average metabolic costs of various activities can be seen in Tables I-A and I-B. For a more complete listing the reader is referred to the article by Reiff et al.[2] Generally speaking, the degree of strain imposed by an activity depends on its intensity relative to the maximal intensity of which a person is capable. Thus, jogging at 5 mph (requiring 9-10 Mets) is a more strenuous effort for the average middle-aged, unconditioned male whose maximal capacity is 8-11 Mets than for the athlete whose capacity may be as high as 20-23 Mets.

Assuming that there are no contraindications to exercise,* the physician should have some idea of his patient's response to exercise. In this way, the patient's status is known before he begins to exercise on his own, any functional abnormalities not seen in the rest-

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This paper was originally presented at the Eighteenth Annual Scientific Assembly of The Delaware Academy of General Practice, March 1970. At that time Dr. Skinner was Assistant Professor of Applied Physiology, Laboratory for Human Performance Research, The Pennsylvania State University. He is now Wissenschaftlicher Assistent, Lehrstuhl für Kreislaufforschung and Leistungsmedizin, Medizinische Universitatsklinik, Freiburg im Breisgau, West Germany.

*This important area is not covered in this article but can be found elsewhere (3-5).

Table I-A

Average Metabolic Cost of Activities

Mets	Occupational	Leisure
1.5 – 2.0	Desk work, driving a car	Flying, motorcycling (pleasure)
2.5	Bartending, mechanical work on car, hunting (sitting)	Mowing lawn (riding mower), power boating, shooting, shuffleboard, woodworking, washing car
3.0	Janitorial, light welding	Billiards, bowling, canoeing (2.5 mph), fishing (from boat, bank, or ice), horseshoe pitching, golf (power cart)
3.5	Stocking shelves, assembly line (with some lifting)	Horseback riding, iceboating, archery, sailing (handling boat)
4.0	Painting, masonry, paperhanging	Table tennis, mowing lawn (power mower), golf (no cart)
5.0	Carpentry	Gardening, lawn work, social dancing
6.0	Pneumatic tools, chopping wood (hand axe or saw)	Cycling (9.4 mph), fishing (wading in stream), hiking, hunting, mowing lawn (push mower), shoveling (10/min – 9 lbs.), square dancing, water skiing
8.0	Carrying 70–90 lbs.	Basketball (nongame), tennis, canoeing (4 mph)
9.0	–	Cycling (13 mph), snow skiing, shoveling (10/min – 14 lbs.)
10.0	–	Tobogganing
12.0	–	Handball, squash, shoveling (10/min – 19 lbs.)

ing state may be revealed, the intensity of the exercise program can be individually prescribed, and data are obtained that can serve as a baseline for future comparisons. Such testing should be done in the physician's office under controlled conditions, with direct measurements of maximal work capacity, ie, the maximal level of work at which the oxygen requirement of the muscles can be supplied by the cardiorespiratory system, maximal heart rate, or the work intensity at which a clinical end-point is reached, eg, onset of angina, claudication, ST depression of the exercise ECG, etc. A multi-stage test with progressively increasing work loads is best for this purpose[6-8]; various tests with different types of apparatus are available. If the physician does not want to take his patients to their maximum, the cardiovascular responses to a series of standardized work loads can also be used to predict

TABLE I-B

AVERAGE METABOLIC COST OF CONDITIONING ACTIVITIES

Mets	Activity	Mets	Activity
	Walking (mph)		Canadian 5-BX
1.4	1	7.0	Level 1A
2.2	2	9.0	Level 2A
3.0	3	13.5	Level 3A
4.0	4	12.5	Level 4A
6.5*	5	14.5	Level 5A
	Running (mph)	14.0	Level 6A
9.5*	5		
11.0	6		
12.3	7		
13.6	8		
14.8	9		
16.0	10		

*Note: Walking at speeds greater than 4 mph is inefficient. Running requires a larger energy expenditure because of the greater vertical displacement of the body's center of gravity.

the working capacity.[9-11] Because a number of work loads are included, the physician has additional objective information to use in his exercise prescription.

To better evaluate his patients, the physician should be aware of the changes that normally occur with advancing age. In numerous studies[9,12,13] it has been shown that beginning with the third decade, maximal oxygen intake capacity and maximal attainable heart rate decrease with age. Although active persons have a higher level of fitness at all ages, it appears that their rate of decline in maximal capacity and heart rate does not differ from that of the average person. In other words, while the active person experiences approximately the same reduction in functional capacity with age, his level is still higher than the average for men of his same age. Thus, with conditioning, one should not expect to alter his rate of aging, but only his position on the scale for functional capacity.

The physician should also be aware of three aspects of conditioning: overload, specificity and reversibility. Overload means that physiological systems will not increase in size, functional ability, or both, unless they are stressed enough so that adaptation is required. Conditioning is specific; only those systems which are stressed will adapt. Finally, as so many persons are well aware, the effects of conditioning are transient and reversible. With repeated applications of stress (regular exercise), one adapts (becomes conditioned) by increasing his maximal work capacity (fitness). Thus, in oversimplified terms, exercise is a form of stress, and conditioning is a form of adaptation to that stress.

In deciding what program should be recommended, the physician should take into account the age, health, fitness, and needs of his patient. If the main reason for exercising is to lose weight, then the duration must be long and the intensity relatively low, since the total number of calories expended will be greater than if the exercise has to be stopped after a short period of high-intensity work because of exhaustion. On the other hand, not much adaptation is required of the cardiorespiratory system with low-intensity exercises, and this program would not be adequate for someone who wants to improve his maximal work capacity. In addition to medical considerations, the time and facilities available

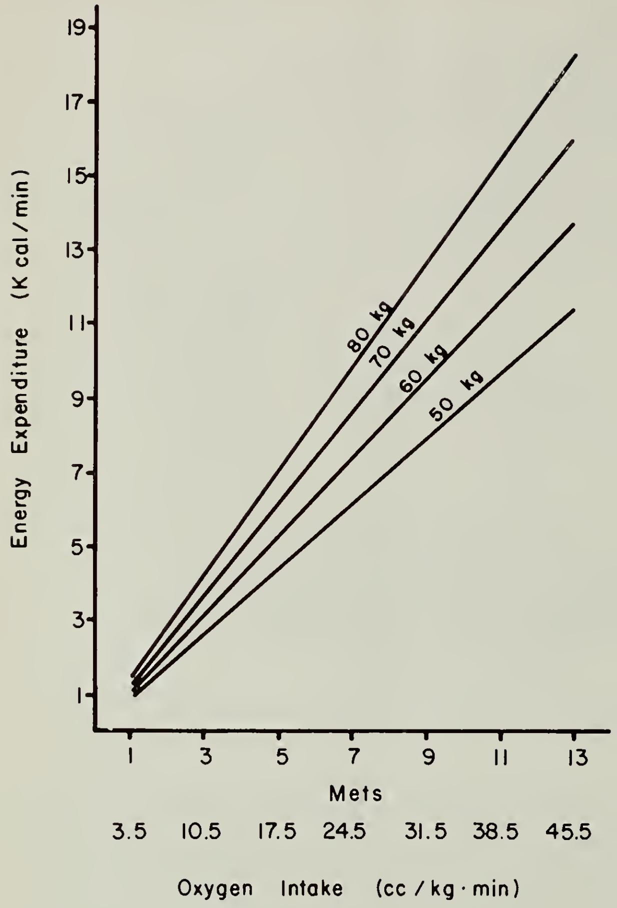

Figure 1

Relationship of Mets (Work Metabolic Rate/Basal Metabolic Rate) and Oxygen Intake to Energy Expenditure in Men of Different Body Weight.

to the person, as well as his personal preferences, should be considered when recommending activities. Since medical and personal factors differ among individuals and in the same individual over a period of time, there is no one program which can or should be recommended.

Sedentary people who decide to increase their activity should begin with a "starter program" lasting approximately six to eight weeks. In this way, they can adapt to small, gradual increases in their level of activity. Unfortunately, many people start with the premise that if a little exercise is good, then more is better. By attempting too much too soon there is incomplete adaptation. This affects various systems of the body and may result in general soreness, musculo-skeletal problems, cardiovascular problems, and problems in maintaining interest in the program.

If possible, a starter program should be done under the supervision of a qualified physical education instructor who can teach the appropriate exercises, individualize the program to some extent, monitor the increases in intensity, and provide a degree of health surveillance. The use of an instructor, while preferable, is not essential for a conditioning program.

Components of Conditioning Programs

Conditioning is a product of the duration, frequency, and intensity of the exercise done.

Duration: Generally speaking, an optimal conditioning program should include three phases: warm-up (5-10 minutes), exercise (20-40 minutes), and taper-off (5-10 minutes) for a total duration of 30-60 minutes. The minimal duration of the exercise phase should be 20 minutes, especially in a program designed to improve cardiorespiratory fitness. The warm-up and taper-off phases are especially important in persons over 35. By exercising at low intensities at the beginning of the activity period, time for adaptation is allowed and the transition from rest to work is less stressful. Low-intensity exercise after strenuous activity is also important because it allows a gradual transition from exercise to rest. The slow movements also decrease the possibility of peripheral pooling of blood. For the man who possibly has a compromised circulatory system, reduction in central blood volume may result in syncope or circulatory collapse if he stops exercise too quickly.

Frequency: During the first month the sedentary person should exercise two to three times per week, gradually increasing the frequency to three to five times per week during the second and third months. Preferably, the sessions should be spread evenly over the week, rather than exercising for three consecutive days and doing little or nothing for the next four. There is better adaptation to the increased activity since any residual fatigue or soreness is diminished by a day of rest between sessions. There is no time of day most

TABLE II

GENERAL TYPES OF CONDITIONING PROGRAMS

Duration	Short	Short or Long	Long
Intensity	High	High and Low	Low
Metabolism	Anaerobic	Aerobic and Anaerobic	Aerobic
Major result	Strength Speed	Cardiorespiratory Fitness	Weight Loss Muscular Endurance
Examples	Lifting Heavy Weights Isometrics Sprinting	Interval Training Many Sports (e.g., tennis, handball)	Lifting Light Weights Walking Jogging

suitable for exercising; this is best determined by the individual and his schedule. However, at least one hour should elapse after a heavy meal before exercising too strenuously.

Intensity: If the maximal capacity of the sedentary patient is known or estimated, then the physician should recommend that he work at approximately 50% capacity for the first three to four weeks of the starter program. After this period, he can gradually increase the average intensity to 60% capacity for the last few weeks of the starter program. In this way, the body can gradually adapt to each new exercise intensity.

If the physician has no information on a patient's exercise tolerance but knows of no contraindications to exercise, then he should recommend that the patient begin cautiously and increase gradually. Since most unconditioned middle-aged men have a maximal capacity somewhere around 8-11 Mets, they should not begin with activities requiring more than 4-5 Mets (eg, walking 3.5 mph and faster, jogging 5 mph for short periods of time, etc.).

In some cases a patient may reach a clinical end-point before he has reached his physiological maximum (eg, angina, ST depression, dyspnea). Assuming that the physician knows the work intensity or the heart rate at which these symptoms usually occur in a given patient, he can recommend that the exercise intensity remain near but below this upper-limit.

After a person has been exercising for three to four minutes at the same intensity, he is in a metabolic "steady state," and information on heart rate can be of value. Because of the linear relationship between heart rate and Mets or work load for a given individual, it is possible to estimate roughly the required intensity of exercise by determining the percentage of the maximal heart rate. As a crude estimate, maximal attainable heart rate decreases from 200 at age 20 to 160 at age 60, or approximately one beat per year.

After his starter program, the patient should begin to exercise at an intensity which produces a heart rate of approximately 70% of his maximal heart rate or of that predicted for his age. Occasionally during the exercise periods, the healthy person should experience one- to three-minute episodes of tachycardia of approximately 75-85% of his maximal heart rate. If the duration of this high-intensity interval is less than one minute, the heart rate may not reach 75-85% of maximum and little adaptation is required of the cardiovascular system. If the interval is longer than three minutes, there are subjective feelings of distress associated with increased anaerobiosis (lactic acid); this transient discomfort may persuade a person from continuing to exercise.

By keeping the intervals at approximately two minutes, the heart rate, oxygen consumption, and ventilation increase to near-maximal levels, but the lactic acid remains lower.[14] In this way, the stimulus necessary for adaptation is provided with less discomfort.

Types of Conditioning Programs

Assuming that frequency of participation is the same, conditioning is then the product of the duration and intensity of the various programs. As seen in Table 2, there are three general types of conditioning programs: (1) low-intensity exercise for a long duration (jogging and walking for 30 minutes or lifting light weights many times); (2) high-intensity exercise for a short duration (sprinting for 10-60 seconds or lifting heavy weights one to six times); and (3) interspersing of high- and low-intensity exercises for a moderate duration (running two to three minutes at 75-85% maximum and walking or jogging for two to three minutes at 50-60% maximum). Since they can be done aerobically and for a long time, the low-intensity exercises are useful for weight reduction. However, little adaptation is required and this program is not adequate for improving cardiorespiratory fitness. At the other extreme, if the intensity is too high, then there is insufficient time for the cardiovascular system to adapt and the person has to stop because of exhaustion. Because of the medical complications possible in men who are at the age where their circulatory system may be affected by atherosclerosis, this type of exercise should be discouraged. The chances of musculo-skeletal problems and soreness are also greater with intense activities.

Lifting of heavy weights and isometrics should be avoided in middle-aged men since mean blood pressure rises markedly in this type of work.[15] In addition, the increased intrathoracic pressure associated with the Valsalva maneuver can affect the flow of blood returning to the heart. While increased strength and muscle tone are needed in most middle-aged men, there are better, less potentially dangerous methods available (eg, rhythmical calisthenics). Aside from the possible risks involved, little or no increase in cardiorespiratory fitness has been reported with this type of conditioning.[16]

Somewhere between the two extremes of duration and intensity lies a better method of conditioning known as interval training. This form of training combines the advantages of both extremes since the intensity and the duration are moderate, and by interspersing periods of low- or moderate-intensity exercises between periods of high-intensity exercises one is able to continue exercising for longer periods of time. The total number of calories expended can be high and there is stimulation and therefore improvement of both the aerobic and anaerobic capacities of the individual. It also requires adaptation to and recovery from intense activity. In oversimplified terms, interval training is an inefficient way to transport the body from one place to another (running at the same speed throughout would be more efficient). Because of this inefficiency it requires more adaptation and is, therefore, a more effective way of conditioning.

It should be mentioned at this point that many sports (eg, tennis, handball, basketball, etc.) are similar to interval training in that there are periods of varying intensity. While they are useful and effective adjuncts to a conditioning program, the duration and intensity of the intervals are more erratic and less well-controlled. For this reason, strenuous games should not be the sole method of conditioning, especially not until a person has conditioned himself to that intensity level. Also, only the top athletes in these sports have a high level of cardiorespiratory fitness and they must practice many hours per week. The average recreational player has a fitness level only slightly higher than that normal for his age. Thus while perhaps more enjoyable, games are not particularly effective for conditioning.

Changes with Conditioning

In order to evaluate the effects of his exercise prescription, the physician should be familiar with the changes that normally occur with adequate conditioning programs. The amount of improvement to be expected depends largely on the age and fitness level at which one begins.[17,18] Thus, at relatively

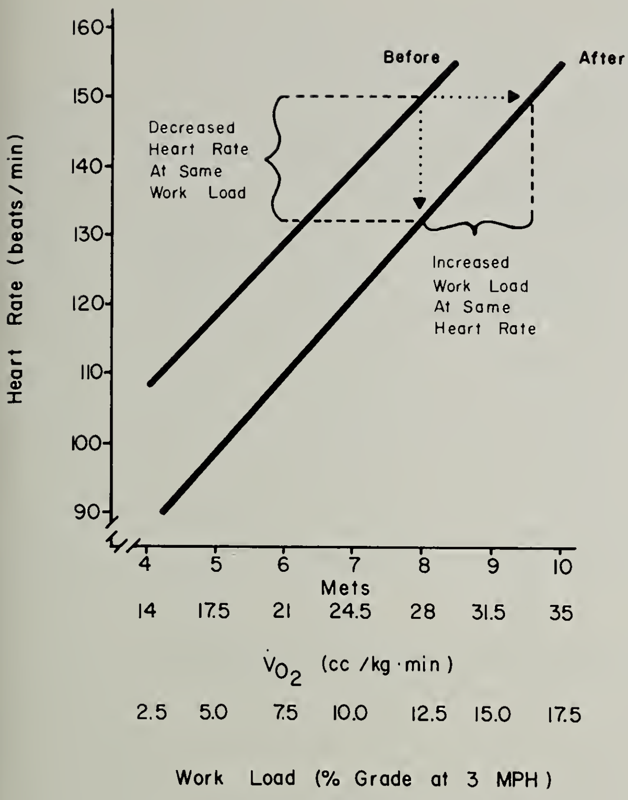

Figure 2

Typical Changes in the Relationship of Heart Rate to Energy Expenditure after an Effective Physical Conditioning Program.

higher levels of fitness, there will be less probability of improvement. Likewise, the older a person is when he begins a conditioning program, the less improvement he should expect, since conditioning requires adaptation and aging may be defined as a loss of ability to adapt.[19]

Figure 2 graphically illustrates one of the first adaptations to occur in a group of middle-aged men after conditioning. At a standard work load, expressed as oxygen consumption in cc/kg•min (the basis for determining Mets), there is a reduction in exercise heart rate. Likewise, at the same heart rate, conditioned men can do more work. Since little or no difference in maximal heart rate should be expected, this information can be of value to the physician and his patient. For example, a physician may suggest to his patient that he begin exercising at an intensity requiring 75% of his maximal heart rate (136 in a 40-year-old man with a maximum of 180). If after conditioning for a while, the patient finds that exercising at a level of 8 Mets now requires a heart rate of only 128, he can then increase the intensity until his heart reaches 136 (ie, overload). If no contraindications exist, then the intensity can also be increased to a higher heart rate so that more adaptation is required. In this way, the intensity of exercise can be controlled to fit each individual.

If the patient continues with the same program, there will be a plateau in his responses to standard work loads. This is an indication that no further adaptation is required or, in the case of the older or highly-conditioned person, that no further adaptation is possible. In the former instance, one can continue with the same program or increase the intensity, frequency, and/or duration of exercise. The decision on what to do should be based on reasons for exercising (eg, weight control, improved cardiorespiratory fitness, etc.), health status, level of fitness, personal interests, and personal schedule. It may be that the patient is satisfied with his program or status and feels that the additional time and effort required for more improvement is impossible or unacceptable at that time. The minimal goal, however, should be at least an average level of fitness for one's age. (Table 3) Since it takes less time and/or effort to maintain one's functional capacity than it does to improve it, a patient can begin a maintenance program once he decides that he is satisfied with his current level of fitness.

Maintenance Programs

As mentioned earlier, conditioning is a product of the duration, frequency, and intensity of the exercise program. While it is possible to maintain one's level of fitness by decreasing the intensity of the exercise, this is less desirable from a training standpoint. If one wants to maintain his fitness while decreasing duration, then he must increase either the frequency or the intensity. Just as there is a limit on how many times one can exercise each week, there is a limit on the maximal intensity at which an individual can work, ie, if the intensity is too high, then the duration must be short and the type of adaptation re-

TABLE III

AVERAGE VALUES OF MAXIMAL OXYGEN INTAKE (CC/KG·MIN) FOR MEN OF DIFFERENT AGES.*

Age (yrs.)	Maximal Oxygen Intake (cc/kg·min)				
	Low	Somewhat Low	Average	High	Very High
20–29	≤38	39–43	44–51	52–56	≥57
30–39	≤34	35–39	40–47	48–51	≥52
40–49	≤30	31–35	36–43	44–57	≥48
50–59	≤25	26–31	32–39	40–43	≥44
60–69	≤21	22–26	27–35	36–39	≥40

* I. Astrand (2).

quired is different. It should be remembered that 20 minutes is considered the minimum in a program designed to improve cardiorespiratory fitness or for weight control.[20]

Many people prefer to decrease the frequency and either increase the duration or intensity. There is a suggestion from research in exercise physiology that one can exercise as little as two times per week to maintain fitness for short periods of time; the exact length of time is unknown.[21,22] The implication here is that an individual should exercise three to five times per week when his schedule allows more free time (slack periods, vacations, etc.) and then exercise one to two times per week for several weeks during the busier times of the year. Since the effects of conditioning are reversible, however, regular participation throughout the year should be stressed. Also, although the evidence is not definitive, there are suggestions that it is the regularity of activity which is associated with a lower incidence of coronary heart disease.[23]

General Considerations

Although it is common during the first few weeks for the sedentary person to experience some fatigue for three to four hours after exercising, this should diminish. If there is residual fatigue the following morning, this is an indication that the intensity or amount of work was too great and that there has been incomplete adaptation. If fatigue still persists after two to three workouts, one should stop for two to three days and begin again at a lower intensity. If it still does not disappear, then the physician should be seen to determine whether there is a medical problem.

Extreme environmental conditions should be avoided since the increased load on the circulatory system may be too great. On hot days, care should be taken so that individuals do less work and wear light, loose clothing; rubberized clothing should not be used at any time. A patient can compensate for the effects of heat by decreasing the work intensity enough to keep his heart rate at the prescribed level. After a workout, the use of saunas and steam rooms is not recommended, at least not until the person has cooled off sufficiently and then only with adequate supervision. The person who is still perspiring has an excess heat load and a hot room will add to that load, increasing the water loss. This, together with further pooling of blood in the arms, legs, and skin, can result in circulatory collapse.

When exercising in the cold, whether it be running, skiing, or shoveling snow, people should warm-up adequately indoors before going outside and then begin to exercise gradually. Since some people have a tendency to remove excess clothing when overheated, this should be avoided as it may expose the lower neck and chest to abnormally high rates of cooling. This excessive cooling can trigger reflexes, causing vasoconstriction in the myocardium. As a result, the myocardial oxygen supply is restricted when it is needed most. It should also be remembered that the incidence of cardiovascular accidents is higher in middle-aged men when they perform hard work in the cold.

Many of the changes that occur with conditioning are difficult to measure but still very important. It has been reported that men who exercise regularly note many positive psychological effects on their feelings toward their work, on their behavior, and on their health.[24] It was also found that while an exercise participant gave many reasons for becoming more active, it appeared that the attitude of his wife was closely associated with his degree of participation, ie, if his wife had a positive attitude toward his conditioning program, his participation was much better than if his wife had a negative or neutral attitude. Therefore, the physician should inform the wife of the need for her cooperation and *positive* support when her husband begins a conditioning program.

Finally, a point mentioned in the beginning of this paper should be emphasized again, ie, in order to more objectively prescribe exercise to a patient, the physician should know the exercise tolerance of that patient. This implies the need for an exercise test, preferably a series of progressively increasing work loads with adequate time at each intensity (two to four minutes) to allow the person to reach metabolic "steady-state." With knowledge of how each patient reacts to varying intensities of work, the prescription of activities (dosage, type, and intensity) can be more objective. Exercise testing is also useful in the diagnosis of coronary heart disease, for evaluating progress, and for motivating a person to begin and to continue participating, and may help a person develop a personal interest in his health and functional capacity.[4,5,25,26]

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Science begets knowledge; opinion, ignorance. *Hippocrates*

Highlights

TESTING AND DEVELOPING CARDIOVASCULAR FITNESS

Lieutenant Colonel Kenneth H. Cooper, USAF (MC), *Annual Scientific Assembly and Annual Meeting, Delaware Academy of General Practice, March 1970.*

Jogging, said a recent TV show, ain't never helped anyone but chicken thieves, moonshiners, and Yankees. Nevertheless, there is today ample evidence that exercise programs including jogging can improve cardiovascular capacity.

What are some of the demonstrated effects of conditioning the cardiovascular system by exercise?

1. A decrease in the resting heart rate. Since 20 beats/min represents 10,000 beats per eight hours, a decrease in heart rate represents a decrease in cardiac work. At the same time, there is an associated increase in stroke volume and decrease in myocardial catecholamine content. In a study by J. Stamler, 1329 males without coronary disease were followed for ten years. The deaths from coronary disease, sudden deaths (presumed cardiac) and deaths from all other causes correlated directly with resting pulse rate, indicating a relationship between resting pulse rate and longevity. Sudden death was three times more frequent in those with pulse rate above 90 when compared with those with pulse rates less than 70. Coronary deaths were more than twice as frequent.

2. A change in the optimum maximal heart rate. That is, with continued exercise and maximum conditioning the heart rate attained in oldsters increases while the exercise rate of younger persons actually decreases.

3. Increased heart size. This effect raises the old question of whether the athletic heart is bad. It is true that athletes' hearts may be slightly larger than expected, but it seems that this hypertrophy may represent an optimum and more healthy state. The heart is after all a muscle and can be expected to increase its size, strength, and efficiency as a response to exercise. It has been shown that myocardial vascularity in a series of dogs who received a partial ligation of one coronary artery was greater in the group of animals subjected to exercise following the coronary obstruction than in non-exercised animals. Both pressure and hypoxic stimuli may be serving as the stimulus to an increase in capillary circulation. A high output tachycardia seems necessary for improvement in collateral circulation, with the hypoxic muscle responding to stress by increasing the myocardial vascularity, both by dilating the existing channels and creating new ones.

In experiments with exercise in normal animals with patent coronary trees, no increase in vascularity was found from an exercise program. However, the data from autopsy of battle casualties in the Korean War revealed that by the age of 22, a high percentage (77.3%) of young American men already have some degree of coronary artery disease. (JAMA July 18, 1953).

The heart enlarged by disease is a different situation from the cardiac hypertrophy of exercise. Whereas the normal heart weighs less than 300 gm and has an average vascularity of 3992 capillaries per mm^2, the heart enlarged by disease averages more than twice heavier but has about one-third diminished vascularity. Thus increased size alone does not insure an increase in vascularity; this is dependent upon the cause of the hypertrophy. (Proc for Soc Exp Biol and Med Vol 38, 1938.)

White reported (NEJM Nov 16, 1961) the postmortem cardiac exam of a man who had been running competitively for more than half

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At the time Dr. Cooper presented this paper he was in the United States Air Force Medical Corps. He has since resigned his commission and established a private clinic and research foundation in Dallas, Texas.

a century. His coronary arteries were found to be unusually large, two to three times normal size. Still, it is sometimes argued that such arterial dilations in runners may be the cause of their track expertise, rather than the effect.

4. Changes in hematology and blood chemistry. Conditioning is associated with an increase in total blood volume, hemoglobin and RBC mass. There is an increase in the fibrinolytic enzymes. Muscle fibrils become larger, more vascular. Triglycerides decrease after vigorous exercise and remain decreased for 24-36 hours, another argument for the repetition of an exercise program at least thrice weekly. There is similar but less constant lowering of cholesterol. The lowering of abnormal blood sugar elevations may be due to the frequent concomitant decrease in weight.

5. Decrease in blood pressure after six months of conditioning. (JAMA March 9, 1970.)

6. Renal changes. An increase in glomerular filtration rate has been shown in young men following a nine-week conditioning program. The specific effects if any in patients with chronic renal disease have been less well evaluated. (Clin Resch Jan, 1970.)

7. Less depression, hypocondriasis, and fatigue. The Russians have clearly shown a decrease in absenteeism and accidents, and an increase in work production with the institution of conditioning programs conducted in their industrial plants. The Chief of Staff of the United States Air Force recently encouraged commanders, where possible, to allow up to two hours of duty time per week for exercise conditioning in an effort to improve general functioning and work output.

8. Increase in maximum oxygen consumption. This is the most important change. The objective definition of fitness is the ability to consume in excess of 42 ml/kg/min O_2 consumption, age adjusted. Such a level indicates adequate cardiovascular reserve. Levels in the 80's are not uncommon in Scandinavian cross country skiers, or track stars.

Oxygen consumption can be evaluated in several ways. A bicycle ergometer may be used, but the limits of exercise tolerance by the muscles of the legs may be reached before the maximum exercise tolerance of the cardiovascular system.

The treadmill test is better but requires a heavy investment in equipment and personnel for its operation. The 12-minute test (JAMA Jan 15, 1968) is the field test which correlates best with the laboratory treadmill testing. In this test the distance which can be run in 12 minutes indicates the individual's aerobic exercise capacity with a correlation coefficient of 0.897. If 1.5 miles can be achieved in 12 minutes, this represents a maximum 0_2 consumption of 42 ml/kg/min and is consistent with good condition for men under 30 years. The distance requirement decreases to 1.40 miles at age 40 and 1.25 miles above 50. It is in the neighborhood of 1.3 miles for females under thirty.

Despite their average age of 19, only 56% of the young men who join the Air Force are fit, and nine years later less than 20% can be classified as being physically fit.

Unfortunately between the ages of 22 and 24, there is a marked decrease in exercise performance by the American male. During these years, when he is most likely to have just married, he gains an average of five pounds, even though the total weight gain from ages 20 to 30 averages only eleven pounds.

In a study comparing the fitness of Austrian and USA males 19 to 29 years of age, a much higher level of fitness was found in the Austrians. Analysis of mortality data for the two countries indicates almost three times as many deaths from myocardial infarctions in American men 35 to 44 years old as in their Austrian counterparts.

Heart attacks are second only to accidents as a cause of death in men in the American Air Force, despite the fact that less than 2% of age. In one six-months' study, there were of the Air Force personnel exceed fifty years nine heart attacks with two deaths in a control group of 12,000 unexercised airmen but only one heart attack and one death in the exercise group involving over 15,000 men.

There is also evidence of lower mortality rate from heart attacks which occur in patients who have regularly exercised, and the incidence of repeat myocardial infarction is decreased in groups who are rehabilitated after their infarction with a regular, medically supervised exercise program.

Regular exercise programs may help patients with angina, objectively and also by coronary angiographic studies. These patients in particular require a very carefully supervised exercise program which is, at the onset especially, one of walking rather than jogging.

The physician who recommends an exercise program to middle-aged persons or to persons with known heart disease should be familiar with the cautions to be observed. In a recent article (JAMA March 9, 1970) Dr. Cooper's recommendations are detailed. There is also the newest book, *The New Aerobics*, M. Evans & Co., 1970 and condensed in the March 1970 *Reader's Digest* which details the point system of graded exercise, for men and women of different ages and different degrees of fitness at the onset of an exercise program.

Despite our highly advanced systems of providing care to the victims of established heart disease, we have lagged behind in the provision of preventive care. Since regular stressful exercise consistently improves cardiovascular performance in all aspects, it behooves those of us concerned with advising our patients how to prevent heart disease to become aware of various aspects and precautions of exercise programs.

COLORECTAL CANCER*

G. S. Serino, M.D. — *Chief in Surgery, St. Francis Hospital.*

Colorectal cancer occurs about 2% more frequently in women than it does in men. It strikes at all ages, but the peak years of occurrence coincides with the years 55 to 70. Most large bowel cancers (70-75%) are found in its terminal portion — where the cancers can either be palpated by digital examination — or visualized by a proctosigmoidoscopic maneuver.[1]

Cancer of the colon and rectum will strike 73,000 Americans this year, more than any other type of cancer except skin. About 46,000 die of it annually, though almost three out of four patients might be saved by early diagnosis and proper treatment.

About 75% of these deaths are avoidable, preventable by the mere addition to annual physical checkups of digital and proctosigmoidoscopic examinations. Most colorectal cancers are slow growing; this therefore means that yearly rectal checkups will find the cancer as a localized process.

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*Abstracted from Medical Times, March, 1970.

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WHY I TAKE HEROIN

I used to see my friend doing it and I didn't want to be left out. I started mainlining about six months ago. I learned how to do it in the street — in my neighborhood. I even sold drugs in my school for $2 a bag. I had a lot of customers. Nobody taught me, nobody forced me, but I didn't want to be left out when I saw my friends use drugs.

Ralph de Jesus, 12 years old, Bronx, New York
(N. Y. Times, February 26, 1970)

Editorials

PRE-HOSPITAL CORONARY CARE IN DOWNSTATE DELAWARE

The effectiveness of coronary care units in preventing deaths from myocardial infarction is now widely recognized. The death rate from infarctions has fallen from 40% to 20% in large series over the past three years. Critical analysis revealed that 60% of the deaths occur within the first hour, and another 25% within the next 24 hours. The obvious solution is to get the patient to the coronary care unit earlier or, less obviously, to get the coronary care unit to the patient. The latter concept of the mobile coronary care unit has been started in several areas of the world over the last three years.

The classical mobile coronary care unit is a well-equipped, well-staffed ambulance. The staff usually consists of a physician, a nurse, and an attendant. The equipment is the same as the hospital coronary care unit with the exception of transvenous pacemakers. Early reports indicate that the death rate from heart attacks can again be significantly lowered with proper application of the coronary care unit on wheels.

All of the downstate hospitals now have functioning coronary care units, and Kent General Hospital has full-time emergency department physicians trained in coronary care and resuscitation. The individual hospitals are fortunate in having enough personnel to staff their individual units, making mobile units as outlined above impractical. Does this mean that the rural areas should abandon all planning in regards to mobile units as a part of pre-hospital care for the infarction victim?

A possible compromise might be found in using available ambulance personnel. A recent piece of legislation introduced in the Delaware General Assembly would require ambulance personnel to be not merely taxi drivers but rather individuals trained in emergency care of the sick. Experience in coronary care units has shown that two relatively safe drugs, namely, lidocaine and atropine, can be lifesaving in preventing fatal arrhythmias from developing. It is quite possible, in my opinion, to properly train paramedical persons to recognize dangerous or potentially dangerous rhythms and treat them while transporting the patient to the hospital. We now urge physicians to give lidocaine in the home to a coronary suspect if he has irregularities of his heart action or tachycardia, and atropine if he has a bradycardia. Why not train ambulance personnel to recognize the obvious signs and symptoms of a heart attack, take an apical pulse or even use a portable monitor, start an intravenous infusion, and administer these drugs when indicated? This is a departure from the time-honored idea that the physician is the only one capable of making decisions in treatment of the sick, but a giant step has already been taken in this direction in the responsibility passed on to the coronary care nurse-specialist today.

If these proposed paramedical personnel, on the scene, could be only a fraction as effective as our coronary care nurses have been, the number of D.O.A.'s in our emergency rooms would be considerably decreased.

C.A.

* * *

PLUMB UNEXPECTED: NEW SOURCE OF LEAD POISONING

An unexpected epidemic of lead poisoning from earthenware pottery has been reported from Montreal by Doctor Michael Klein in the September 24 *New England Journal of Medicine.* Lead poisoning from pottery was common in ancient Rome. The Romans recognized the symptoms of plumbism and correctly attributed them to the use of lead in cooking utensils, pottery and water conduits. Historically, much has been made of chronic lead poisoning's contribution to the decline of Rome.

In 1723, the Massachusetts Bay Colony prohibited the use of lead stills for distilling rum. (My North Carolina forebears, perhaps more from inverse serendipity than wisdom, employed copper tubing and vessels in their illicit distilling operations. The corn liquor and sour mash whiskey tasted better.)

Doctor Klein and his associates in Montreal tested 264 earthenware glazed cups and pitchers collected locally. One-fourth of these released enough lead to cause severe, acute lead poisoning. Half of the vessels released enough lead to make them unsafe for everyday use. Although the pottery examined by Doctor Klein was purchased in Canada, all glazes (frits) used in Canada and the United States originate from American chemical companies. Presumably, the risk of lead leaching from pottery into contained liquids, especially if they are warm and/or acidic, would be as great in the United States as in Canada.

Unfortunately, lead in most commercial frits is not chemically bound to other materials and can be dissolved readily in solutions contained in earthenware containers. Stoneware, unlike earthenware, is never made with lead frits and is fired at higher temperatures in larger kilns than earthenware. The stoneware process is used more often for commercial pottery in larger manufacturing operations.

The more dangerous earthenware with its lead glaze is fired at no more than 2,050°F. to produce its shiny surface. Only a pottery expert can distinguish readily between earthenware and stoneware, and there is no legal requirement for labeling when lead is used in the glazing process. Only by asking the right questions and receiving the correct answers can one determine whether an item of pottery contains the dangerous lead glazing material.

The October 10, 1970 issue of *Science News* reported the death of a two-year-old child in Montreal from drinking warm apple juice from a lead-fired earthenware pitcher. His older brother, though desperately ill, survived.

A Buffalo physician was hospitalized with severe gastrointestinal discomfort. Anorexia, constipation and weakness were preceded by malaise and headache so typical of lead poisoning. The offender? Nightly Coke from an earthenware mug made in a university ceramics class by his son and presented as a gift.

To the industrial hazards of lead so clearly revealed by the duPont scientists, to the lead poisoning from paint eaten by slum children in old buildings, and to the hazards of tetraethyl lead from the internal combustion engine must now be added the insidious threat of lead poisoning by culinary use of earthenware pottery. Pewter, although it presents some of these same hazards, fortunately is not used so widely. Heated and acidic liquids, especially those remaining in earthenware vessels, would seem to be the most hazardous.

During recent years the handcrafting of pottery has extended far beyond the hill country of the Carolinas. All over the United States, handmade pottery abounds in small shops and larger stores. These deadly but appealing earthenware items appear in ever increasing numbers. Production by so many diverse small operators and hobbyists, many of whom sell their pottery or distribute it as gifts, makes meaningful labeling, control or restrictive legislation nigh impossible.

W.D.J.

* * *

IS ALL QUIET ON THE WESTERN FRONT?

The past ten years have witnessed a sporadic yet progressive dissolution of the barriers that divided the medical community of Delaware into island fortresses, each manned by ardent champions ready to do battle in support of a "territorial imperative." The predictable result of such federalization of spirit of these separate states is the more efficient use of the available manpower and armaments for the delivery of patient care and the promotion of medical education. Thus, institutions unrelated by secular, religious, governmental, or financial endowment began to find a harmony of purpose that only now is being reflected in an emerging unity of professional and administrative activities.

In the past few weeks one of the hospitals of New Castle County revoked the hospital privileges of a large number of physicians for hospital by-laws infractions, involving either meeting attendance, or minimum patient admissions.

Let us not now, under any guise of puritanical vengeance, divide the almost unified company into hostile hosts arrayed against each other. Let no hospital return to the feudal closed staff system, no matter how ostensibly reasonable the proferred excuses. For if we turn our backs on the painfully wrought progress of the past few years, we are marching blindly back to the fighting forties with separate standards antheming our chosen army in defiance of all other armies and in defiance of reason.

C.I.G.

* * *

PROCEEDINGS OF THE HOUSE OF DELEGATES, 1970

MEDICAL SOCIETY OF DELAWARE

The following Resolutions were considered at the Annual Meeting of the House of Delegates of the Medical Society of Delaware.

RESOLUTIONS

Resolution No. 1

Whereas, Major health problems affecting this our state have placed renewed emphasis on health education; and

Whereas, The school program should provide students with opportunities to acquire through planned curriculum, knowledge, attitudes and practices which will help them cope with the problems of drug abuse, venereal diseases, family life, and other areas of health; and

Whereas, The School Health Committee members are concerned about the piecemeal type of health education that is being promoted in our state; and

Whereas, A coordinated health education program must be developed throughout our school system from kindergarten through grade 12; therefore be it

Resolved, That this Society request and urge the Delaware State Board of Education to establish a position of Coordinator of Health Education; and be it further

Resolved, That a copy of this resolution be transmitted to the Senate and House Committees on Education.

School Health Committee
Edward F. Gliwa, M.D.
Chairman

Report of the Reference Committee

The Committee recommends the adoption of this resolution. The resolution was adopted.

Resolution No. 2

Whereas, The need for a uniform system of coding and nomenclature in order to describe accurately the great variety of medical services has never been greater; and

Whereas, The American Medical Association has prepared an accurate and current system of coding and nomenclature; and

Whereas, State medical associations, specialty societies, and others have delayed their own efforts so as to be certain there would be one universal system of description of professional services; therefore be it

Resolved, That this House support the system of coding and nomenclature of the American Medical Association; and be it further

Resolved, That the Medical Society of Delaware House of Delegates urge Blue Cross and Blue Shield of Delaware to adopt the AMA system of coding and nomenclature as the universal system for description of medical services.

Marvin H. Dorph, M.D.
William T. Hall, M.D.

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this resolution. The resolution was adopted.

Resolution No. 3

Subject: Medicine, Pharmacy, and Anti-Substitution Laws

Whereas, There exists a wide variety and choice of therapeutic agents, from which the physician must choose those which in his hands are best for his patient; and

Whereas, Only the physician can fully evaluate the response of his individual patient and therefore must not delegate to others medical discretion and judgment, yet physicians may sometimes find it difficult to keep completely informed about the many brands of drugs, their relative quality and cost; and

Whereas, The pharmacist is a highly trained professional in this area and his knowledge is often not used to the fullest extent for the benefit of both physician and patient; and

Whereas, Physicians and pharmacists, with others, are already cooperating through the Delaware Formulary Advisory Board to attempt to assure the prescribing and dispensing of high quality drugs at reasonable cost; and

Whereas, The American Pharmaceutical Association, in order to achieve for pharmacists a wider scope of activity in which to use their knowledge, has recommended that all state anti-substitution laws be repealed and that Delaware be one of the first test states for this effort; be it therefore

Resolved, That the Medical Society of Delaware strongly oppose any efforts to repeal the anti-substitution laws in this state because such a move would not be in the best interests of the patient and would result in the involuntary delegation of medical judgment and discretion; and be it further

Resolved, That this House of Delegates reaffirm its support of the Society's cooperative efforts with pharmacy and others through the Delaware Formulary Advisory Board, and in addition instruct the Council to develop other mechanisms through which medicine can more fully utilize the knowledge and expertise of pharmacy for the benefit of the patient without the improper delegation of medical discretion and judgment.

William O. LaMotte, Jr. M.D.

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this resolution. The resolution was adopted.

Resolution No. 4

Whereas, The 125th General Assembly passed an act to amend Sub-chapter 5, Chapter 17, Title 24, Delaware Code, providing for immunity of members of Medical Council of Delaware, the Board of Medical Examiners of Delaware, the County Medical Censor Committees, the State Osteopathic Censor Committee, and physicians who are members of hospital committees whose function is the review of medical records and of physicians' work with the view to quality of care and utilization of hospital facilities from suit or liability or action taken as members of such organizations and committees; and,

Whereas, The original House Bill #276 had different wording as follows: "Immunity of members of Medical Council of Delaware, the Board of Medical Examiners of Delaware, Osteopathic Examiner of the Medical Council, members of the County Medical Censor Committees, the State Osteopathic Censor Committee, and physicians who are members of hospital and medical review and utilization committees"; and,

Whereas, The original wording as above protected members of State and County Medical Society committees, but the amended wording as enacted into law does not; and

Whereas, Immunity is just as necessary for the members of appropriate committees of the Medical Societies as it is for all the other groups mentioned in this Legislation; therefore be it

Resolved, That this House instruct the Committee on Public Laws to pursue with vigor efforts to amend this law in order to achieve wording which will accomplish this purpose.

William O. LaMotte, Jr. M.D.

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this resolution. The resolution was adopted.

Resolution No. 5

Subject: Methods of Delivery of Health Care, Prepaid Group Health Care for the State of Delaware sponsored by the Medical Society of Delaware, and

Peer Review and Professional Evaluation

Whereas, The present fee-for-service approach to the practice of medicine operating in the market place of our free enterprise system has come under considerable criticism in some circles as a "non-system" of health care; and

Whereas, The Council of the Medical Society of Delaware on the basis of this criticism has approved in principle the development of a prepaid system of group health care for all citizens of the state on an option basis to be operated through the foundation approach; and,

Whereas, The statistics emanating from existing prepaid group practice systems do not necessarily reveal that such systems are superior in quality and reduced costs to our present so-called "non-system"; and

Whereas, Nowhere in the pronouncements of the society to date in this connection has there appeared any recognition of the existence of merits to our present fee-for-service system of medical practice; and

Whereas, In four months of operation the society's Peer Review and Professional Evaluation Committee has found much more good than bad in our present system; and

Whereas, The evidence exists that a pluralistic approach in our society to the problems of delivery of health care is desirable and beneficial; be it therefore

Resolved, That this House not write off the merits of our present system of health care delivery in order to be "with the crowd" in substituting for it as yet untried alternatives, and that the Council be instructed in future comments on this subject to emphasize the merits as well as the faults of the present system, and be it further

Resolved, That any sponsorship of a prepaid group practice for the State of Delaware be at the inception at least on a limited and experimental basis, such as for Title XIX recipients, rather than an option for the entire population; and be it further

Resolved, That this House affirm its support for Peer Review and Professional Evaluation as the best means of assuring high quality health care at reasonable cost under our present system of health care, and while it recognizes the necessity for experimentation to determine the merits of other alternative approaches, it meanwhile fully suports our present fee-for-service private enterprise medical practice system, strengthened by an increasingly viable and visible Peer monitoring mechanism, until such time as experiments reveal the wisdom of extending alternatives to the entire population.

William O. LaMotte, Jr., M.D.

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of the third Resolved only. The resolution was adopted by retaining the second and third Resolved's and omitting the first Resolved.

Resolution No. 6

Amendment to By-Laws regarding Membership.

Resolved by the House of Delegates of the Medical Society of Delaware:

1. That Article III, Section 2, Active Members, Line 4 be amended by deleting the word "member" and inserting instead the words "an active member in good standing" and by adding the following sentence at the end of the Section: "Active membership in the Society is mandatory for active members in a component society."

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this part of the resolution. The resolution was adopted with the addition of the word "State" before "Society is mandatory for active members in a component society."

2. That Article III, Section 5, Rights of Members be changed to Article III, Section 6.
3. That Article III, Section 6 be changed to Article III, Section 7.
4. That Article III, Section 7 be changed to Article III, Section 8.
5. That a new Article III, Section 5, Affiliate Members be inserted to read as follows: "Affiliate Members. Affiliate members may be medical students, interns, and residents in an accredited educational program recognized by this Society. They will have all rights, privileges, and responsibilities of active members."

Report of the Reference Committee

The Reference Committee does not have a quorum. Those members present recommend the adoption of this part of the resolution. The resolution was amended by deleting the word "all" in the new Section 5 and adding at the end of the paragraph "except holding elected office" and was then adopted.

6. That Article III, present Section 7, Dues and Special Assessments, Lines 4 and 5 be amended by deleting the words "member shall pay annual dues to the society of eighty-five dollars ($85)" and inserting instead the words "and affiliate member shall pay annual dues to the Society in an amount to be determined annually by the House of Delegates."

Report of the Reference Committee

The Reference Committee does not have a quorum. Those members present recommend the adoption of this resolution. The resolution was adopted.

❧

Amendment to By-Laws regarding Sessions and Meetings.

Resolved by the House of Delegates of the Medical Society of Delaware:

1. That Article X, Section 10, Rules of Order, Lines 6 and 7 be amended by deleting the words "Robert's 'Rules of Order' " and inserting instead the words "Sturgis' 'Standard Code of Parliamentary Procedure'."

Report of the Reference Committee

The Reference Committee does not have a quorum. Those members present recommend the adoption of this resolution. The resolution was adopted.

❧

Amendment to By-Laws regarding the Council.

Resolved by the House of Delegates of the Medical Society of Delaware:

1. That Article VII, Section 1, General Powers be amended by deleting throughout the word "Council" and inserting instead the words "Board of Trustees."
2. That Article VII, Section 2, Composition, Line 1, be amended by deleting the word "Council" and inserting instead the words "Board of Trustees," and Line 2, be amended by deleting the word "Councilors" and inserting instead the word "Trustees."
3. That wherever the term "Council" appears in the By-Laws, the term "Board of Trustees" should henceforth be used and that wherever the term "Councilor" appears in the By-Laws, the term "Trustee" should henceforth be used.

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this resolution. The resolution was adopted.

⁂

Amendment to By-Laws regarding Standing Committees.

Resolved by the House of Delegates of the Medical Society of Delaware:

1. That Article XII, Section 1, Named be amended by adding "(6) Committee on Peer Review and Professional Evaluation."
2. That Article XII, Section 4, Election and Tenure, Line 2 be amended as follows: "of standing committees with the exception of the Committee on Peer Review and Professional Evaluation."
3. That a new Article XII, Section 11, Peer Review and Professional Evaluation be inserted to read as follows: "The Committee on Peer Review and Professional Evaluation consists of a State Chairman, appointed by the President, six members or more appointed by the President of the New Castle County Medical Society, and three members or more appointed by the respective Presidents of the Kent and Sussex County Medical Societies. The Committee shall review all proper complaints and inquiries brought before it by physicians, patients, state and federal government agencies, and other third parties, except those complaints and inquiries that would fall under the purview of other existing committees. Further, the Committee shall concern itself with establishing criteria for mode of practice with all associated ramifications, medical necessity, over-utilization in home, office, and institution. Reasonable rules and operational procedure shall be established by the Committee in the development of positive programs as they evolve. This is not primarily a disciplinary committee but rather an educational committee."

Report of the Reference Committee

The Reference Committee does not have a quorum. Those present recommend the adoption of this resolution with the omission in Section 11 of the word "over" before the word "utilization" and with the omission of the last sentence in that paragraph: "This is not primarily a disciplinary committee but rather an educational committee." The resolution was adopted with the recommendations of the Reference Committee plus the addition of the word "annually" in Section 11, Line 3, after the word "appointed."

⁂

Amendment to By-Laws regarding House of Delegates.

Resolved by the House of Delegates of the Medical Society of Delaware:

1. That Article VI, Section 2, Composition, Line 9 be amended by inserting the words "all Past Presidents" and by deleting the word "Councilors" and inserting instead the word "Trustees."

Report of the Reference Committee

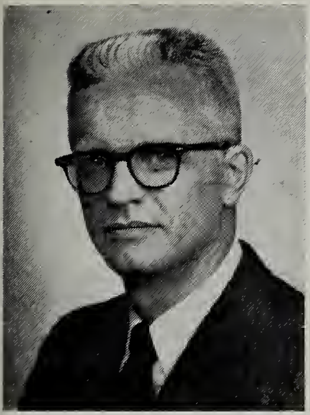
The Reference Committee does not have a quorum. Those present recommend the adoption of this resotuition. The resolution was adopted.

The complete report of the Proceedings of the House of Delegates is on file in the Medical Society office and is available to members for reference.

MEDICAL SCHOOL FACULTIES AND FAMILY PRACTICE

There is little evidence that medical school faculties really believe in family practice to the point of being willing to make fundamental change in the nature and direction of education. But it is not easy to change an established system, and most members of faculties are the products of such a system. They are unlikely to make major changes unless there are strong pressures to do so. Do we have any right to expect that present efforts will meet the public demand for a large number of physicians to provide comprehensive health care? The answer must be "no" at this time. We should not delude ourselves into thinking we are moving rapidly toward the goal.

Dr. C. H. William Ruhe, Director, Medical Education Division,
American Medical Association



President's Page

A MEMO FROM THE PRESIDENT

Legislative bodies in both the State and the Nation have reopened in Dover and Washington, respectively. Our Public Laws Committee must muster itself to meet the challenge of supporting and initiating good health legislation in Dover. Missing from the legislative ranks in Washington will be Senator John Williams, one whose accomplishments are legend. He was always kind, courteous, and helpful when it was necessary for us to visit with him and ask his aid or opinion about proposed laws being considered in Congress.

As he left office he continued to think of his state by retiring early, permitting Senator Roth the gain of valuable seniority, thereby assuring Delaware a superior position on important Senate commitees. We welcome you home, Senator Williams.

* * *

We are reputed to have a poor "press." The latest unfair indictment of physicians was the announcement by HEW, that Medicare rates would be elevated by the end of June 1971, because of the mounting costs of medicine resulting from doctors' increased fees. We know this is not possible. In December 1968, the Secretary of HEW, Mr. Wilbur Cohen, suggested, upon retiring, that all Medicare allowable medical fees should be frozen. On taking office in January 1969, President Nixon adopted Mr. Cohen's suggestion; thereafter, no extra increase in medical fees has been paid. Again, we, as a small minority, are faced with the dilemma of proving our point against the word of a powerful government bureau, in this instance, HEW.

* * *

The ranks of physicians in Delaware are thin. One of the national factors contributing to fewer doctors in private practice is ever increasing insurance rates for practicing physicians. In Canada no such increase in rates has occurred because contingency fees are not permitted. Perhaps legislation can be introduced requiring a hearing in the medico-legal screening panel of the Medical Society of Delaware and the Delaware Bar Association before a suit involving a contingency fee can be heard.

* * *

Members of the Medical Society of Delaware were recently exposed to a new Health Care Delivery System (Delaware Academy of Medicine Building, January 7, 1971) based on the principle of private enterprise. It is a personal opinion that the introduction of something new should be given careful consideration, for it's too late to close Pandora's box once opened. — *Beware of the Greeks bearing gifts!*

Rhoslyn J Bishoff

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Coordinator of the Community Council on Emergency Service — L. Mario Garcia, M.D.

In Brief

n the News

William J. Holloway, M.D., director of the Wilmington Medical Center Infectious Disease Research Laboratory for many years, has been chosen as one of twenty physicians from throughout the country to serve on the General Committee of Revision for the 1970-1980 edition of the United States Pharmacopeia. The Revisions Committee consists of physicians, chosen for their special knowledge in drug therapy, supported by forty experts in pharmacy and related sciences. Dr. Holloway will serve as the physician expert in antiviral and antimicrobial drugs.

Henri F. Wendel, M.D., has been reappointed to the Council on Environmental and Public Health by the Board of Trustees of the AMA; W. O. LaMotte, Jr., M.D., reappointed Chairman, Council on Legislation; and H. Thomas McGuire, M.D., presently Vice-President of the AMA, reappointed to the Council on Mental Health and also to the Joint Committee on Mental Health in Industry.

Charles M. Bancroft, M.D., Chairman of the Medicine and Religion Committee of the Medical Society of Delaware, is one of a number of physicians invited this year to the *National Prayer Breakfast* to be held at the Washington Hilton Hotel, February 2, 1971 with the President and Mrs. Nixon as honored guests. This is the first year that physicians as a professional group have been invited. The purpose of the National Prayer Breakfast is to bring the nation's Official Family together to ask God's guidance in the fulfillment of their duties and responsibilities during the coming year.

unds Needed

The deans of all medical schools have indicated their increasing need for funds from AMA-ERF. The state AMA-ERF Chairman for the Woman's Auxiliary of the MSD is Mrs. John W. Howard, 114 Rodaline Avenue, Lewes, Delaware, 19958. Please send your contributions to her.

elaware Seminar

The Medical Society of Delaware, in cooperation with the AMA, is co-sponsoring a program of seminars and a lecture in the medical sciences. Lewis A. Barness, M.D., Professor of Pediatrics, University of Pennsylvania School of Medicine in Philadelphia, will speak on *Nutrition and Brain Development* at the University of Delaware in Newark on Wednesday, March 17, 1971.

National Ambulatory Medical Care Survey

The National Center for Health Statistics is planning a National Ambulatory Medical Care Survey (NAMCS) to collect objective, quantitative information to measure and describe the types of ambulatory patients seen by physicians, the nature of patients' problems and the resources available for their care. The survey will be conducted early in 1971 among a sample of 800 physicians selected randomly across the country.

Physicians selected to participate in the survey will provide information concerning a sample of the patients that they see during a two-day period in each of four consecutive calendar quarters. All physicians will be replaced by new sample physicians after participating for four quarters. The types of data collected will include age, sex, and medical problems of patients plus treatment prescribed and laboratory tests performed for patients. All data will be held completely confidential and used only for statistical purposes. The success of the NAMCS will depend on the cooperation of practicing physicians who are the major source of ambulatory medical care data. The AMA and numerous other major medical associations have expressed their support for the NAMCS and have provided advice and consultation in its development. The survey will provide very valuable data for documenting the health status of the American people and for forming public and private policy decisions.

SMA Training Grant and Loan Fund

Those physicians who are seeking additional education in the form of residency training and fellowships may apply for a Southern Medical Association Residency Training Grant. This project of the Association provides funds to allow a physician to complete a chosen number of years of training and still receive an income. While recipients of a grant assume no legal obligation to repay, it is hoped all will assume a moral obligation to do so. Official application forms may be secured from the Southern Medical Association, 2601 Highland Avenue, Birmingham, Alabama, 35205. The deadline for receiving applications each year is April 1.

Aid for International Medicine

Aid for International Medicine is currently collecting medical texts, no older than 1960, for distribution to the University of Kabul in Afghanistan, and for the University Hospital at Poona in India. All suitable text books can be left with Dr. Syrovatka at the Academy of Medicine or can be left with John Levinson, M.D. or Carl Glassman, M.D. Aid for International Medicine also offers to collect and distribute for the Southbridge Medical Activities Committee any donations in money or materials which might be suitable for the neighborhood health center in Southbridge. Please contact either John Levinson, M.D., Edgar Miller, M.D., or Carl Glassman, M.D. if any such donations are available. In either case AIM will be pleased to provide a statement of evaluation of such gifts for Internal Revenue purposes.

Speakers on "Ask the Doctor"

Speakers for February, 1971, on the Tuesday radio program (11:05 a.m. WDEL) produced by the Medical Society of Delaware are: February 2, Janet Kramer, M.D., *Dangerous and Narcotic Drugs;* February 9, William H. Duncan, M.D., *Community Outreach Programs of the WMC;* February 16, William T. Hall, M.D., *Arthritis;* February 23, Forrest G. Hawkins, M.D., *Childhood Safety.*

CLINICAL NOTICES AND MEETINGS

Nephrology Seminar

The American Heart Association will present the 2nd Annual Nephrology Seminar, *The Community Practice of Nephrology,* February 22-24, 1971, at Durham and Chapel Hill, North Carolina. Address inquiries to: Alfred M. Bennett, M.D., American Heart Association, 44 East 23rd Street, NYC, 10010.

Congress on Medical Education

The 67th Annual Congress on Medical Education will be presented by the Council on Medical Education of the AMA at the Palmer House, Chicago. Included are programs of *Federation of State Medical Boards of the United States,* February 11-14, 1971; *Association for Hospital Medical Education,* February 12-13, 1971; and *Council on Medical Education,* February 14-15, 1971.

U. of P Course

The University of Pennsylvania School of Medicine announces the course, *Current Concepts in the Therapy of Coronary Artery Disease,* to be given February 24-26, at the U of P School of Medicine; tuition fee is $100.00. For further information contact the Office of Graduate Medical Education, 288 Medical Laboratories Building, University of Pennsylvania, Philadelphia, 19104.

Contemporary Ophthalmology

The Society for Contemporary Ophthalmology will hold its first annual meeting March 4-6, 1971 at the Diplomat Hotel and Country Club in Hollywood, Florida. The theme of the meeting is continuing education for excellence in ophthalmology with special emphasis on modern trends in the management of ocular diseases. Registrants are invited to attend the Society for Cryosurgery meeting at the same hotel on March 1-3. For further information write the Society at 30 North Michigan Avenue, Room 1629, Chicago, Illinois, 60602.

Allergy PG Course

The American Academy of Allergy will present a two-day Postgraduate Course in connection with its 27th Annual Meeting, February 20-21, 1971, at the Palmer House in Chicago. The Annual Meeting Scientific Sessions will convene Monday, February 22nd, at 8:30 a.m., ending at 3:30 p.m. on Wednesday, February 24th. The program for these three days will highlight presentations of new research in allergy and related fields. Full information regarding all sessions can be obtained from the Academy's Executive Office, 756 N. Milwaukee Street, Milwaukee, Wisconsin, 53202.

Rehabilitation Course

The New York University Medical Center will offer a comprehensive full-time course on *Rehabilitation in Chronic Lung Diseases,* March 1-2, 1971. Tuition is $100 and registration is limited. For an application, please write: Dr. Edward H. Bergofsky, NYU Institute of Rehabilitation Medicine, 400 East 34th Street, New York, N.Y., 10016.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

PATHOLOGIST: Experienced Director, Hospital Laboratories and consulting pathologist. Graduate, Georgetown University School of Medicine, 1947. Certified American Board of Pathology.

OBSTETRICIAN-GYNECOLOGIST: Graduate, National Taiwan University, Formosa. American internship and residency. Passed Part I, American Board of Obstetrics and Gynecology. Immigrant status.

"OPPORTUNITY" APPLICATIONS

The AMA PLACEMENT SERVICE, which is sponsored by the state Medical Societies, supplied the **Journal** with record cards of physicians seeking opportunities to practice in the State of Delaware. We list their specialties, medical school, and residence. Physicians may contact this office for further information if interested.

ORTHOPEDICS (4)

- Hahnemann Medical College, '63. South Natick, Massachusetts.
- University of Illinois College of Medicine, '64. Eglin Air Force Base, Florida.
- University of Brussels, '65. Currently on active duty (USPHS).
- Cornell University Medical College, '64. Englewood Cliffs, N. J.

INTERNAL MEDICINE (3)

- Internal medicine and cardiology with teaching if possible. All India Institute of Medical Sciences, '61. New Delhi 5, India.
- Gastroenterology. University of New York Medical School, '59. San Antonio, Texas.
- Cardiology. University of Rochester School of Medicine, '65. APO, New York.

GENERAL SURGERY (2)

- General and thoracic surgery, University of Istanbul Medical School, '54. Erzurum, Turkey.
- Thoracic and cardiovascular surgery. West Virginia University School of Medicine, 64. Houston, Texas.

RADIOLOGY

- Institute of Medicine, Bucharest, '60. Chicago, Illinois.

OPHTHALMOLOGY

- University of Alberta, '60. Montreal, Canada.

UROLOGY

- University of Toronto, '60. Battle Creek, Michigan.

ANESTHESIOLOGY

- Ohio State University College of Medicine, '62. Columbus, Ohio. Salary-type position desired, especially with federal agencies and public health organizations.

THE FORUM

Environment And Health

DELAWARE INTERAGENCY COUNCIL ON SMOKING AND HEALTH

Coordinating Office:
AMERICAN CANCER SOC
1925 Lovering Ave.
Wilmington, Delaware 19

merican Cancer Society
Delaware Division, Inc.

elaware Congress of Parents
and Teachers

elaware Heart Association

elaware School Health Advisory
Committee

elaware State Board of Health

elaware State Dental Society

e'aware State Department of
Public Instruction

elaware Tuberculosis and
Health Society

epartment of Education
Diocese of Wilmington

reater Delaware Valley
Regional Medical Program

ledical Society of Delaware

/ilmington Public Schools

January, 1971

Dear Physicians:

Few health professionals realize just how influential they can be in urging others to quit smoking. That's probably because the results aren't always immediate. The fact is it is difficult to predict just when a reminder by a physician, dentist or nurse will be the reminder that is meaningful to a patient.

That's why your Delaware Interagency Council on Smoking and Health is asking all health professionals to make a New Year's resolution to urge their patients to quit smoking.

If you think your patients need a few facts for reinforcement, just call us at 654-6267. We have a variety of films and literature designed to help people who are thinking of kicking the habit. Also, last year the Interagency sponsored six smoker's withdrawal clinics for about 200 persons who either quit or cut down their smoking habits.

The Interagency calls on you who have a great power to prevent as well as to treat disease to make smoking education an annual commitment for the better health of all Delawareans.

Sincerely,

Arthur R. VandePoele
Chairman

Sponsored by The Delaware Tuberculosis and Health Society

Delaware
Medical Journal

FEBRUARY, 1971
VOLUME 43
NUMBER 2

MEDICINE TODAY

• Today's medical care, education, and delivery system are discussed by the present president of the AMA.

Walter C. Bornemeier, M.D.

Certainly no one needs to wonder why we should take a good look at the medical care, education, and delivery system. Reporters, columnists, commentators, government, citizen groups — almost everyone is having a field day criticizing the profession, the medical schools, the hospitals, the drug manufacturers, the drug stores, the insurance companies, the Social Security Administration, or any and all of the people concerned with health care. If one can refrain from becoming emotionally involved while reading this material, it must be admitted that it contains a lot of truth. Naturally some of the conclusions are not what we would consider valid. Many of the writers use a few facts and then proceed to overreact. This does not, however, mean that the facts upon which conclusions are based are erroneous.

The doctors of today will have to admit that we are in serious trouble and that failure to do something about it that will change the picture rapidly, will invite the government to blunder in with a scheme that could well compound the illness of the present medical care system. The possibility of preserving the free enterprise system of delivery of health services depends on whether we make the right moves and whether we can do this soon enough. The fact that we are in serious trouble could seem to indicate that we have not had good advice over the past two decades. I would admit that we either have not had good advice or we have failed to listen when the advice was given. The latter could be nearer the truth. Today we embrace concepts that we rejected ten years ago. Ten years ago we embraced concepts that were unacceptable to us twenty years ago. What we need to do is to become realists and do today the things that need to be done today.

The physician has been trained in medical school and in his practice to accept change slowly. Until material and methods have been proven to be safe and effective, it would be dangerous to move too rapidly. If we as doctors would grasp each new suggestion before adequate study, we would kill more people than we cure. We have earned the label of conservative and we must continue to wear it wisely and well.

Now, however, we are in a crisis. The crisis is chiefly one of manpower. There is really not

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Dr. Bornemeier is President, American Medical Association. This paper was originally presented at the 181st Annual Meeting, Medical Society of Delaware, October 17, 1970.

much wrong with the present system that competition cannot cure. The question is, how do we increase the number of physicians and what do we do until this new supply arrives on the scene?

There are those in our society, especially in government, who would propose a system of universal health insurance which would be compulsory and let the doctor work for the government. In other words, let the government pour more money into the delivery system. I would wonder where the government could buy more health care. Health care is already overbought. What we need is money put into supply. In addition to putting money into scholarships, teaching, expansion of teaching facilities, we need to revise the timetable of our educational system.

This latter will not be too difficult because we already have a group of young, energetic, competent deans of medical schools who are aware of the problem. Experimentation and innovation have become competitive. Each week we hear of a new or novel program for increasing the output of physicians. The February 1970 Congress on Medical Education sponsored by the Council on Medical Education of the American Medical Association devoted almost all of its session to innovation in medical education.

First, let us deal with medical education in the first three of its four phases: (1) premedical, (2) medical, (3) internship and residency. Continuing education, which is the fourth phase, the never-ending phase will not be discussed. So here goes. Can we shorten the premedical education? Can we shorten the four-year medical curriculum? The answer to this one is that it is already being done. Number three, can we shorten and alter the intern-residency portion of training of the doctor of medicine so it will be more appropriate to the needs of the country and the needs of our time? Will we reduce the quality of the end-product by abbreviating the present three-phase educational program?

A few months ago at the Annual Congress on Medical Education I heard during the question and answer period this question, "Who do you think is competent to decide that a three-year medical school can produce a high-quality graduate?" This was answered by another question, "Who was sufficiently competent to decide that it takes exactly four years to produce a high-quality graduate?"

First Facts

The first fact that needs to have careful attention is the difference in the learning capacities of the students. Can a curriculum be developed which can permit one student to finish medical school in three years, and at the same time to permit another student to stay for five years, or to move on into the internship *without* all of the clinical polish of his A.O.A. classmates? Northwestern University has had a small group for quite a number of years, carefully selected, who move into the medical school after two years in premedicine. So far this program is working well.

Thirty or forty years ago many medical schools took in freshmen with two or with three years of premedical preparation, provided they had completed certain basic requirements. These boys did as well as the rest of us and were young enough upon graduation to spend an extra year or two in specialized training. At the present time, from college to completion of a residency is about eight to ten years. Add the premedical, and we get a *minimum* of a dozen years in formal schooling.

We should take a look at this period between age 22 and 32 and ask ourselves if all of this time is well spent, "Is all of this trip necessary?" True, during the four years in medical school, the student spends only about 36 months out of the 48 in school. Does he need twelve months' vacation in four years, this young, vigorous, eager person? This is the age in which the professionals play football and baseball, the best years of their lives. Why can't we move our medical students more rapidly?

The answer, of course, is that we are seeing it done in some of the medical schools across the country, but not in enough of them.

Why do we need a four-year residency, or an internship and a three or four-year residency? This is five years. Recent studies have shown that advances in medical knowledge have resulted in a half-life of about five years for medical knowledge. This means that every five years, half of what we know is no longer relevant. This would seem to indicate that a doctor could stay in a training program the rest of his life and still not know it all. At age 65, instead of a diploma, he could be given his first social security check. So why keep a student for three, four, or five years after graduation in a sheltered atmosphere? Why not permit our residents to get part of their training in an ambulatory care facility—either with a group, or solo practitioner, approved for teaching? Some specialties could be taught better in a clinic or doctor's office. In fact, all specialties, excepting possibly pathology, radiology and anesthesiology would benefit from substantial office-based training. This would give the young physician responsible contact with patients and their families. It would prepare the trainee for practice *out* of the hospital instead of a total hospital-oriented education. Why not get him rapidly productive? This can be done where he has consultants readily available, but has an opportunity to use his skill in a productive manner. Would this reduce the quality of his education? Many educators think it would improve it.

You all recognize that I am talking about an apprenticeship. In a group practice, he would have several teachers; with a solo practitioner, only one. Thirty-five years ago there were very few residencies. Most people who aspired to become surgeons took two years of internship, and then usually, but not always, worked with a surgeon for a number of years before going into practice for himself. In those days there was no American Board of Surgery, so Fellowship in the American College was the goal of those of us who intended to limit our practice to this specialty. In this day of urgent need to emphasize ambulatory care, it might be well to re-examine the system under which we learned from the practitioner, rather than to continue the present trend toward sitting at the feet of a full-time professor during the undergraduate years and in many instances, continuing in the same atmosphere during the internship and residency.

Many students finish a residency and go out into this fast-moving world without knowing a thing about the economics, the social problems, the political barriers, the color barriers of their future patient. They have no idea of the problems that Mrs. Jones encountered on the way to the hospital bed where she lay, neatly tucked in when the house officer makes her acquaintance. We could spend an entire day discussing the events of this eight- to ten-year period in the life of the boy or girl who becomes a man or woman while becoming a physician. We should (1) shorten both the medical school program and the graduate study; (2) give this future physician more contact with all of the facts of life, let him have contact with the community at community level and let him do this at the elbow of the teacher-physician who knows what it is that makes people sick, not just those who know how to make them well.

Programs to Shorten Curriculum

Let me mention just a few of the programs that are already in existence to shorten the curriculum. Albany Medical College has a program that will give the MD degree six years after graduation from high school. By elimination of the summer vacation, Jefferson, for three years has this program completed from high school to MD degree in five years. Boston University has 50 students on the six-year, high school to MD program. The midwest has a half dozen such programs working and others in the formative stage. Sufficient models to greatly increase the number of graduates are already in existence so those states who are not yet in the numbers game can have a good look at what is going on.

A recent issue of AMA News listed about 40 schools that have increased their enrollment. There is every reason to believe that the models where the freshman year of medical school is given at colleges and universities will work out well.

Attention should be given to shortening the second, third, and fourth year of medical school. By elimination of the summer vacation, these three years can be reduced to about two years. Now if we can eliminate the internship, since the student will have been in the hospital setting for most of his time in the medical school, we can proceed to the residency. The residency should be shortened. A resident in internal medicine or pediatrics who demonstrates unusual capabilities should be permitted to become productive by employment in a group practice or with individual specialists for the final year or two of his training. This would produce a physician who is competent in ambulatory care, which is certainly very necessary in this day of high cost of health care. Thus we might see a combined six-year premedical and medical school and a two-year residency produce a skillful, competent doctor in eight years from high school through residency. This would be eight years from high school, to practice with a specialist who is approved for teaching. Compare that to the present 12 to 14 years that we have had as a standard.

Let's discuss for a few minutes paramedical personnel and physicians' assistants. At the present there are about fourteen paramedical people for each doctor. These technicians do a great bit of the work to lighten the load for the physician. In the past few years, much has been heard and written about a physician's assistant. There are numerous programs for training medical corpsmen as they leave military service. These programs are working well in many rural areas and to a certain extent in urban centers.

However, it is quite possible that no one will ever replace the nurse as the doctor's right arm. For years she has been the tried and true stand-by and helpmate. Nurses must be given more responsibility in decision making. Especially in some of the specialties, the nurse can do most of the routine care so that the doctor need not see the patient at each visit. The nurse can make home visits and communicate with her doctor if she feels he should see the patient. The public and the third party payers must earn to recognize that there will be a charge for these services. They must be prepared to expect the physician to send a bill for the work that the nurse performs.

The Basics

Now let's get to the nuts and bolts of the delivery of medical care. Shall we urge increased practice by groups? The House of Delegates of the AMA has urged physicians to be innovative, to try various models of delivery. In this, we must, of course, include a good look at all plans, including prepaid closed-panel practice.

For those not familiar with this type of group practice, it is a plan where subscribers pay a fixed fee in advance for complete service for a definite period of time, for office, home and hospital care. It is logical to assume that in a place where the doctor and the hospital are paid out of the same limited fund, unneeded hospitalization will not occur. It is also logical to assume that necessary treatment *will* be given in order to prevent more costly occurrences that might ensue if adequate care is delayed. *Statistics* are available to show that this is probably the most economical way to deliver health care. Kaiser-Permanente, a West Coast closed panel group, claims a hospital utilization figure of 525 days per 1000 members. In some areas Blue Cross runs 1100 days per 1000 members, over twice the incidence of the closed panel plans. The validity of these statistics is questioned by some who say that the customer of a closed panel group plan goes elsewhere when he is in need of surgery. For surgery they say, he wants a fee-for-service doctor of his own choosing. Before we either accept or reject the concept of closed panel plans, we need more accurate statistics. But for people who prefer to purchase medical care in this manner, facilities should be available.

In Colorado, according to an article in the February 2, 1970 *Medical Economics*, "Doctors may soon be operating two comprehensive prepaid health programs that some believe, could sharply reduce the cost of medical care both locally and, by example, nationally." These programs have medical society approval and are based on a limited physicians' panel. These plans include policing of private practice *in office and hospital* for those who are members of the group. The Denver plan has a unique feature in that the physician will continue to practice in his own office, the administration will be done by a nonprofit foundation which collects the premiums from the subscribers who can be individuals, insurance companies, unions or employers. The charges will be checked by an M.D. review board working with computers, and if approved, paid by the foundation for both doctor and hospital. Subscribers will have free choice of any physician on the foundation panel which will be open to all doctors in five counties. The services would be on a fee-for-service basis, but there would be central efficiency control, a built-in peer review of both quality and quantity of service. The doctors will charge according to the Colorado relative-value scale, with conversion rates of 2.4 for medical services and 6.0 for surgical services. This corresponds to usual and customary. The Colorado Plan may have been stimulated by the fact that Kaiser-Permanente is moving into the Denver area. The Denver Plan introduces the fee-for-service and freedom of choice concept into the so-called Closed Panel Group Plan. So far the Denver plan seems to have gained the acceptance of the physician; virtually 100 per cent of those practicing in the four counties surrounding Denver have signed up. In the city itself, more than 60 per cent are in the fold.

Another plan is apparently getting underway in the Denver area. Blue Cross-Blue Shield are proposing a comprehensive, closed-panel program based on a fee-for-service basis. At present, 1300 of the state's 2850 physicans have signed up for *this* program. Thus, a physician can be a panelist on both the Metropolitan Denver Foundation and the Colorado Blue Cross-Blue Shield Panel Practice Plan and still take care of patients who subscribe to neither one. Patients will certainly carry identifying cards so the doctor knows to whom to send the bill. No doubt both of these plans will cause the physican to be cautious about over-utilization. It is expected that there will be a noticeable swing to ambulatory care, thus cutting the total cost of health service in Colorado by reducing hospitalization and over-utilization. Says *Medical Economics*, "Developments there (in Denver) could well foreshadow similar changes on a national scale."

All of the changes that have been enumerated are evidence that the medical profession is being innovative and is willing to do everything necessary to increase the production of physicians and the efficiency of the present system. Let me repeat, money must be put into increasing the supply of medical care. Money poured into the *purchase* of care is compounding the problem; the present supply is already overbought. Let's continue to be innovative, let's encourage quantity while maintaining quality and introduce all possible efficiencies into our medical care delivery system. Let's keep the snowball rolling so that the free enterprise system of medical care can be preserved for the benefit of the people of these United States.

HAZARDS OF HOSPITALIZATION

"... Discriminating selection of measures may be more important than unreflective completeness ... it may be as useful to the patient that his physician know when not to treat as when to treat and that the use of potentially dangerous agents for trivial or inconsequential complaints may not be justifiable. Only by such discipline and understanding may we, as physicians, avoid doing unnecessary harm and minimize the price we and our patients pay for modern management of disease." (Barr D: Hazards of modern diagnosis and therapy: the price we pay. *JAMA 159: 1452, 1955.)*

THE PROS AND CONS OF AUTOMATED TEST GROUPS

• Multiphasic Testing, a blessing or a bust? The evidence for each viewpoint is here reviewed.

Ralph E. Thiers, Ph.D.
Orville J. Golub, Ph.D.

Is *Automated Multiphasic Health Testing* a liability or an asset? Do profiles provided by groups of tests help or hinder? Is *unsolicited information* valuable or hazardous?

These questions and other versions of them are occupying large amounts of space both in the medical journals and in the professional news press today, with authorities lining up vigorously and vocally on one side or the other.

While our evaluation does not conclusively answer the above questions, the following list of pros and cons represents our brief interpretations of points made by the news items or journal articles referred to numerically.

Several points become apparent to us in considering this list and the references on which we based it. First, the strong feelings which the subject seems to engender have apparently masked some important facts and confused some important questions. For example, few speakers or writers distinguish between crucially different uses for Automated Test Groups:

(a) As additional data aiding diagnosis during work-up of patients.
(b) As additional aid during management of patients.
(c) For surveillance of out-patients.
(d) For detection of disease through testing selected high-risk sections of the population.
(e) For evaluating the health-status of the whole population or a randomly selected portion of it.
(f) For monitoring the normal status of individuals.

Obviously one cannot generalize about so wide a spectrum of applications. Nevertheless, the most vocal statements on either side usually fail to separate these variables. One group tends to extrapolate the dramatic yields of unexpected abnormalities for (a) aiding diagnosis as though they provided (e) an evaluation of the health-status of the population; the other tends to take the overwhelming amounts of data, high cost, and low yields of the latter use of multiple testing (e) and imply that this invalidates the use of such testing for (a) diagnosis or (b) management of patients.

Second, one is struck by how very few studies have been performed on these questions where careful experimental controls have been included. Surprisingly few of the pros and cons in the list originate from scientific articles. The remainder come from the professional news media.

The majority of the studies which are reported in the scientific literature bear on the first few items in the list, and support the "pro" side especially as to (a) aiding diagnosis and (b) aiding management of patients. Everyone agrees, at least, that unexpected data result from "profiles." Clear evidence has been obtained over the last half decade that in the right setting these data aid the physi-

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This paper was abstracted from the August 1970 issue of *The Condenser*. Dr. Thiers and Dr. Golub are associated with Bio-Science Laboratories, Van Nuys, California.

PRO

Unearths unexpected abnormal data.[1,2,3,4,5,6,7,8,9]

Provides data which detect undiagnosed disease.[1,4,5,7,9,13]

Enables the physician to detect asymptomatic disease.[4]

Aids earlier, more accurate diagnosis.[1,2,4,9,16,17]

Early detection of disease improves morbidity figures.[12]

Aids industry in reducing group insurance premiums, reducing absenteeism and increasing productivity among workers.[20]

Abnormal data on symptomless people can be followed for long periods and will teach the physician much.[4,16]

Provides economies for the patient.[16,19,21]

Saves physician's time.[9,19,21]

Relieves physician of work by picking up clues for him.[4,12,16,23]

Accomplishes at one time what would probably be done piecemeal anyway.[7]

Suggests other tests.[7]

Will teach the real normal ranges in the population.[27]

Provides a baseline of normal values for individual patients.[9,27]

Decreases number of samples which must be taken and their volume.[26]

Improves speed, efficiency and quality control in the laboratory.[16,23]

Improves accuracy of data.[26]

Groups tests based on specific problems or directed at specific organs.[28]

Educates physicians to the true meaning of lab tests.[26]

Patient response to "screening" is very positive.[9]

Future medical practice will be more preventative and predictive and will depend on surveys including Lab Profiles.[26,30]

CON

Unexpected abnormalities are not followed up by the physician.[5,10,11,12]

Physicians ignore unsolicited data.[10,11]

Swamps the physician with unsolicited information.[5,11,14]

Physicians have difficulty in interpreting unexpected abnormalities.[11,15]

Provides negligible useful diagnostic information.[11,18]

There is no indisputable proof that early detection of disease improves morbidity figures.[12,16]

Tests are useless unless a physician is specifically interested in the results.[12]

Is more expensive for the patient.[11,22]

Consumes physician's time in nonproductive fashion.[24,25]

Increases physician's work because of high incidence of false positives unless laboratory accuracy is outstanding.[3,11]

Is dangerous because of false negatives.[19]

Diverts efforts and money from other health-care priorities.[19]

Abnormalities are far more widespread in normal populations than is realized.[11]

Frightens symptomless patients.[11]

Decreases physician's control of sample and sample taking.[26]

The user is restricted to one specific set of tests.[26]

High cost of capital equipment.[11,26]

Disseminates more inaccurate data.[12]

Test groupings are organized arcund chemical considerations.[26,28]

Groups tests in medically meaningless fashion.[28]

Insufficient data exist on the value of grouping tests to warrant the practice.[26]

Leads the public to expect too much.[9,29]

May give the patient false sense of security.[9]

cian to make earlier and more accurate diagnoses and, not infrequently, to detect important undiagnosed or asymptomatic disease. The most modern studies imply that the optimal setting for grouping of tests may not be the medical center or large hospital, but rather may be the group practice or individual practitioner.[7] There appears in these settings to be less interference from medication or other treatment, which may confuse the issue, and less tendency for the physician to be intimidated by false positives.

Cases of diabetes, renal disease, hepatic disease, gout, iron deficiency anemia, hyperparathyroidism, and multiple myeloma seem to form (in rough order of decreasing frequency) the list of totally unexpected diagnostic "assists," not to mention asymptomatic hypercholesterolemia and hyperuricemia. More studies (with experimental controls) are badly needed.

Third, the studies found without exception that fewer than half of the unexpected abnormal data could be shown to have any immediate diagnostic significance. This fact can produce either a pro or con reaction — the more recent studies seem to regard it as evidence for the long-term value to the individual and his physician of continuing knowledge of profiles which include such unusual values. Repetitive baseline values, resulting in greater confidence in the levels found, can be accumulated over a period of years of patient visits. Gradual changes or trends in certain of the levels found are then more meaningful when compared to the same tests by the same procedures at earlier dates — and have more significance than isolated values with only a population normal range for comparison.

Finally, it seems to us that the most vigorous proponents and opponents have underestimated the average American physician. Overenthusiastic proponents seem to imply that laboratory data can, all by themselves, contribute to the care and well-being of the patient. The outspoken opponents clearly imply that the physician cannot or will not handle additional unexpected information about his patient. We believe that both of these extremes are just that — extremes. Each physician serves patients in his own most effective pattern. As time passes it will be interesting and instructive to watch as this new and controversial tool finds its proper place in the practice of medicine.

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NOT ONLY OF HIS PRACTICE

The practicing physician cannot long think only of himself and his practice. Sooner or later, he will form some concepts about society and other group activities. In the present maelstrom of extreme social ideologies, he must take some position on a number of social and philosophical dogmas regarding ethnic problems, student renegades, and war of awesome consequences.

A. T. Harren, M.D., Medical Opinion & Review, September, 1969.

Highlights

MEDICAL PROBLEMS DUE TO DISORDERED BILE ACID METABOLISM

John R. Senior, M.D., *Associate Professor of Medicine, University of Pennsylvania; Medical Conference, Wilmington Medical Center, September* 1969.

The bile acids are the major breakdown products of cholesterol and an important constituent of bile. Their investigation by biochemical, physical-chemical, cytologic and physiological methods has contributed to new understanding of the role of bile acids in clinical problems. Bile acids are known to play a part in 1) pruritus, 2) formation of gall stones, 3) normal fat absorption, 4) steatorrhea associated with the blind loop syndrome and ileal disease, 5) bile acid diarrhea, and, possibly, 6) liver cell injury.

1. *Pruritus.* It is well established that clinical pruritus does not parallel plasma bilirubin concentration but rather corresponds more closely to bile salt concentration. That the bile acids are the culprits in the pruritus of obstructive jaundice was surmised many years ago, but it was not until the relatively recent development of techniques suitable for measuring minute quantities that it has been demonstrated that pruritus varies directly with bile acid concentration in the skin, rather than with the circulating bile salt level in plasma. Current research is being directed towards establishing which particular bile salts are most responsible for the clinical phenomenon of pruritus.

2. *Gall Stones.* Since bile acids are important for solubilizing the various lipid constituents of bile, especially cholesterol, it is easy to suspect a possible role in the development of gall stones. Chemically, bile acids are sterols like cholesterol and are manufactured in the liver from cholesterol. Cholic acid and chenodeoxycholic acid are the major bile acids produced; from these other bile acids are derived. In the bowel there may be further degradation of bile acids to form lithocholic acid from chenodeoxycholic acid, and deoxycholic from cholic acid. In man, bile acids are conjugated through a peptide bond with glycine or taurine, in a ratio of about three to one. The conjugates have greater detergent properties and increased solubility when compared to the unconjugated bile acids. Bile acids appear in bile almost entirely as conjugates. Spatial models of the molecular arrangement show bile acids to have a bent ring structure, the A ring being perpendicular to the B ring. The hydroxyl groups on the concave side are responsible for the water-solubilizing properties or the hydrophilic nature of bile salts, while the detergent or lipid-solubilizing properties are conferred by the hydrocarbon groups of the convex side of the molecule. The bile acids are the most efficient of the body detergents; it has been shown that bile which lacks sufficient bile acid concentration is more likely to be bile in which cholesterol stones appear.

3. *Normal Fat Absorption.* Micelles are molecular aggregates of bile acids and fat digestion products which form a water-soluble phase of fat which is absorbed in the duodenum and jejunum. Dietary fat, nearly all triglyceride, is poorly absorbed, but is split by pancreatic lipase into fatty acids and monoglycerides. Micelles represent aggregates of fatty acids, monoglycerides, and bile acids. When the former two substances are absorbed into the intestinal cells, they leave the bile acid behind them in the lumen of the upper

intestine, to resolubilize more until fat digestion products are all absorbed. After this, the bile acids are ultimately reabsorbed in the distal ileum. Some bile acids are unconjugated by bacterial hydrolytic enzymes during their passage down the intestinal lumen; as free bile acids they are reabsorbed immediately through the intestinal wall and carried via the portal vein back to the liver where they are reconjugated and released again into the bile. It is estimated that this cycle of bile acid recirculation occurs from six to eight times or more per day; a given bile acid molecule may recirculate for weeks until it is ultimately lost via the colon into the stool. Since 40% of the average dietary calories are provided by fat, bile acids which facilitate fat absorption are obviously important to normal food intake.

Digestion of fat is first begun by emulsification of the large fat globules which are further broken down by a specific pancreatic lipase activated at the oil-water interface of the fat droplet. This is an interesting and unique situation in which an enzyme is activated not by the amount of its substrate present but by the substrate's area of interface with the aqueous medium. The bile acids deterge or cleanse the oil-water surface, aggregating with the monoglycerides and fatty acids to form micelles which are water dispersible. There is a critical minimal concentration of bile salts necessary for efficient micelle formation, which in turn facilitates penetration of fatty acids and monoglycerides into the intestinal cells. Inside the cells, the fatty acids are activated and with the monoglycerides are reformed into triglycerides in the canals of the endoplasmic reticulum. From these channels they are extruded into the spaces between the lower portions of the cells as free chylomicron particles which have a phospholipid and protein surface shell. Chylomicrons are therefore different than the original droplets of dietary fat. The chylomicrons have a few strands of surface protein and are really a type of lipoprotein. Unlike simple triglycerides, they do not tend to agglutinate with each other into larger droplets, which would be of a size sufficient to cause embolic phenomena. Other non-lipid food substances, such as amino acids and sugars, are distributed by the gut cells via portal blood to the liver, but the fats enter the systemic circulation directly by way of the lymphatic system following their extrusion from the intestinal cells. Decrease in triglyceride absorption and in chylomicron release is produced by a deficiency of bile salts in the intestinal lumen.

4. *Blind Loop Steatorrhea.* That increase in intestinal bacteria may depress fat absorption has been amply demonstrated clinically. Stool fat was greatly increased in one of our recent patients, for example, who had diabetic gastroparesis and diarrhea. The bacterial count of the gastric content and duodenum was found to average an astounding 100 million organisms per milliliter of fluid. His steatorrhea and diarrhea were diminished by broad-spectrum antibiotic therapy, after a number of other measures had failed. The blind loop syndrome of diarrhea and steatorrhea may now be understood to occur with accumulation of excessive numbers of bacteria in areas of relative stasis in the proximal gastrointestinal tract. Any anatomical or functional condition of the bowel which produces stasis may lead to bacterial overgrowth. It may be that the excess bacteria affect the bile acids to produce products which inhibit the function of the intestinal wall. We now know that unconjugated deoxycholic acid is damaging to intestinal cells in experiments *in vitro*, but not in the patient. This is because *in vitro* the absorbed bile acids cannot be removed from intestinal cells by the mesenteric circulation; it appears to be the intracellular bile acid concentration rather than the surrounding bile acid concentration which is directly responsible for cellular injury. The blind loop syndrome is secondary to a resulting decrease in conjugated bile acid concentration produced by the bacteria. It should therefore be expected to respond either to antibiotic therapy, if such therapy succeeds in lowering the bacterial population, or to surgical correction of the blind loop. The key concept is that stasis allows bacterial proliferation and accumulation. For this reason prolonged antibiotic treatment may not be as effective thera-

peutically as the surgical resolution of the situation leading to the stasis. Sodium taurocholate prescribed as a supplement might theoretically be effective, but is too expensive to be of realistic value and might contribute further to diarrhea.

The normal enterohepatic circulation of bile acids is such that about 98% are reabsorbed at each cycle, with a total recirculation time of two to four hours. If the total bile salt pool is on the order of 4 gm and there is a 2% loss in each cycle, then there will be approximately a 500-900 mg loss of bile acids per day. It may be understandable that it takes only a small amount of ileal disease to succeed in impairing bile acid absorption below this 98% efficiency. In the colon the absorption of salt and water is decreased by an increased bile acid concentration, resulting in a watery diarrhea without steatorrhea. When bile acid return to the liver is decreased, increased synthesis of bile acids is stimulated, as a compensatory mechanism. The upper limit for the liver is approximately a four- or five-fold increase in bile acid synthesis rate; a loss greater than this will result in bile acid deficiency, and a reduction in the bile salt pool.

5. *Bile Acid Diarrhea.* When bile acids are not so efficiently absorbed, the amount reaching the colon of course increases. A drop in small bowel reabsorption only from 98 to 90% produces a five-fold increase in colonic bile acids! The huge bacterial population of the colon acts to deconjugate and dehydroxylate bile acids, producing free secondary bile acids. These inhibit salt and water reabsorption from the colon, and may therefore produce a watery diarrhea, not necessarily associated with steatorrhea.

An understanding of these mechanisms makes it easier to understand the pathophysiology and to prescribe intelligently for clinical diseases involving bile salt loss. For example, a fistula between the colon and the gall bladder will initially result in watery diarrhea, but the eventual depletion of the bile salt pool will cause steatorrhea also. A rational prescription is low fat intake, with the addition of medium chain triglycerides, which are a good caloric source but do not depend on bile salts for their absorption. This may permit positive caloric balance to be attained, with weight gain and general physical improvement in preparation for surgical repair of the fistula.

6. *Liver Cell Injury.* The sick liver of cirrhosis or chronic active hepatitis cannot conjugate bile acids so well. There may actually be a relative increase in chenodeoxycholic acid production, that is, formation of the dihydroxy bile acid instead of the trihydroxy cholic acid. Chenodeoxycholic acid is degraded in the intestine to lithocholic acid, which is a very toxic substance, similar to etiocholanolone in its ability to produce systemic fever when injected subcutaneously. There is evidence that lithocholic acid may damage cell membranes of the liver, thus producing liver injury. If the liver injury further impairs synthesis of trihydroxy cholic acid, instead producing more chenodeoxycholic acid, which may be converted during enterohepatic circulation to even more lithocholic acid, a vicious cycle of progressive liver damage may ensue. Supplemental prescription of taurocholic or cholic acid to compensate for the liver's inability to make it may help to solubilize the poorly-soluble lithocholic acid out of the liver cells, a logical therapeutic action which might be tried and is under study.

Summary

Recognition that a number of rather common clinical problems such as pruritus with obstructive jaundice, gall stones, fat malabsorption, and perhaps chronic liver disease are related to bile acid disorders makes rational therapy possible. Pruritus should be treated, if relief of the obstruction is not feasible, by removing bile acids using the resin cholestyramine to bind bile acids in the gut lumen and increase their loss rate. Prevention of gall stones by inducing changes in bile acid composition of bile is not yet possible, but early trials are underway. If fat malabsorption is due to bile salt deficiency, either more bile salt or less fat should be supplied. While good conjugated bile salts are not yet available at low cost, the prices are coming down, and alternative forms of fat such as medium chain trigylcerides can provide the calories without requiring bile salts for absorption. Therapy of the less common problems of blind loop steatorrhea, ileal disease with diarrhea or steatorrhea can be approached logically and marked improvement effected in the patient's clinical course. The blind loop problem is most efficiently treated by elimination of the cause of intestinal stasis, usually by surgical means, but can be fairly well handled for considerable periods by use of appropriate antibiotics. The diarrhea due to small bowel malabsorption of bile acids is probably best managed by binding the bile acids with cholestyramine and decreasing the dietary fat load.

The bile acids are important in a significant number of clinical problems; better understanding of their metabolism has improved our ability to cope sensibly and effectively with these problems.

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THE ROLE OF VIRUSES AS A POSSIBLE CAUSE OF HUMAN CANCER

Frederick C. Robbins, M.D., *Pediatric Conference, Wilmington Medical Center, September, 1970.*

There are several human tumors which have a suspected but not proven viral etiology.

In Burkitt's lymphoma, intracellular virus particles now established as belonging to the herpes group are found. This virus is referred to as the Epstein-Barr virus (EBV). Unfortunately, attempts to propagate this virus in the laboratory have to date been unsuccessful. Recently, utilizing a fluorescent antibody technique, the Doctors Henle of Philadelphia have discovered that patients with Burkitt's lymphoma, patients with infectious mononucleosis, and indeed, 80% of all adults, have antibody in their blood which is specific for an antigen associated with EBV. These important observations have now been widely confirmed. It is interesting that the relationship of the EBV to infectious mononucleosis was originally recognized somewhat serendipitously from studies on one of the Henles' technicians who developed the disease. Another significant fact is that in tissue culture the white blood cells from most subjects in whom the antibody test is positive will show intracellular virus particles on tissue culture. These observations lend support to the speculation that given the appropriate genetic or environmental co-factors, certain almost universal virus infections have the potential to cause malignant diseases like leukemia or lymphoma.

There is also good serologic evidence that a very large percentage of women with carcinoma of the cervix have at some time been infected with group 2 herpes virus. This is by no means equal to saying that the herpes virus causes carcinoma of the cervix. This particular group of laboratory observations involves research data of which certainty is very difficult and repeated corroborative efforts necessary.

Virus particles similar to the RNA viruses associated with mammary gland carcinoma in animals have been seen in human breast milk, but there is as yet no conclusive evidence to link human breast carcinoma with a virus etiology. For although there are many successful experiments which implicate viruses as the causative agent of animal cancers because of their isolation from these animal tumors, these experiments have not been replicable with human tumors. There are many complicating factors in this type of experiment. One is the impossibility of repeating in humans the same type of experiments which may be carried out on animals. Another is the very long latency of some virus infections. It may be that RNA viruses are present (as has been suggested by recent work done at the NIH) in *all* human cells, and the transition to cancer occurs when there is removal of normally active suppressive mechanism by as yet unknown factors, be they chemical, genetic, ionizing, etc.

It seems unlikely that man is unique among the animal kingdom. If numerous other mammalian species harbor leukemia engendering viruses, then it is extremely likely that so does man. Time and further experiments are bound eventually to tell.

Editorials

CARBENICILLIN*

Carbenicillin (disodiumcarboxybenzyl penicillin) is a new semisynthetic penicillin which has a wide spectrum of activity against gram-negative and gram-positive microorganisms. This antibacterial spectrum encompasses most gram-positive cocci (excluding penicillinase producing strains of staphylococci) and many gram-negative bacilli. Carbenicillin is uniquely effective against the indole-positive strains of *Proteus* and also has good activity against the indole-negative strains of this group of microorganisms. Carbenicillin inhibits most strains of *Pseudomonas* and while it is susceptible to the action of the beta-lactamase produced by most gram-negative bacilli, it appears to be resistant to the beta-lactamase produced by *Pseudomonas aeruginosa.* Carbenicillin is ineffective *in vivo* and *in vitro* against most strains of the *Klebsiella* species as well as strains of *Serratia.* An exception to this finding has been reported[1] in which instance, blood levels in excess of the minimal inhibitory concentration of carbenicillin for strains of *Klebsiella* were achieved with a resultant satisfactory clinical result.

The effective minimal inhibitory concentration of carbenicillin for susceptible pathogens is high when compared to that of other antibiotics. As an example, the usual minimal inhibitory concentration for carbenicillin against strains of *Pseudomonas aeruginosa* ranges from 50 to 300 mcg/ml. The reason this antibiotic is effective *in vivo* is that with the large doses that can be administered, serum and urine levels far exceed those necessary for the bactericidal activity of the antibiotic.

Studies in our laboratory have confirmed the work of others[2,3] showing a marked *in vitro* synergistic effect when carbenicillin and gentamicin are used in combination against strains of *Pseudomonas aeruginosa.*

Carbenicillin has been available for general use in the United Kingdom and most of Europe for several years and has been available for clinical investigation in the United States for a similar period of time. Therefore, extensive clinical experience has been obtained. More than 100 patients with severe infections due to gram-negative microorganisms have been treated with carbenicillin at the Wilmington Medical Center. The majority of the patients treated were suffering from urinary tract infection, sepsis or meningitis. Most of the patients had serious underlying disease, but in spite of this fact the overall treatment results were good.

Carbenicillin is well tolerated when given intravenously, and though it may be administered intramuscularly, we recommend that its use be limited to the intravenous route since intravenously, and though it may be adminis- and seems to offer no advantage in practical therapeutics. While some clinicians[4] recommend constant intravenous drip of carbenicillin, we prefer the intermittent bolus method with the dose of carbenicillin dissolved in 100 ml of diluent and administered by Buretrol over a period of one-half to one hour.

In severe infections, the dose of carbenicillin should be in the range of 400 to 500 mgm/kg/24 hours. In the average adult, we have been accustomed to initial dosing with 2 grams of carbenicillin intravenously every two hours. If there is no clinical response within 24 hours, this dosage should be increased to 3 grams every two hours for the subsequent 24 to 48 hour period. It is possible to enhance the serum level of carbenicillin by the concomitant administration of probenecid in a dosage of 1 gram daily. In some instances, the resultant blood level might be high enough to overcome the resistance of problem pathogens.

Carbenicillin should not be administered to patients with a recent history of penicillin allergy and should be administered cautiously to patients with a past history of penicillin allergy or with any type of allergic diathesis. Side effects from carbenicillin have been rare. Transient increases in the serum transaminase and occasional episodes of leukopenia have been reported.[4,5] In general, these have been reversible on cessation of therapy. Gastrointestinal side effects have occurred but have

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*Geopen® — J. B. Roerig Division of Charles Pfizer & Co.
Pyopen® — Beecham Pharmaceuticals.

been rare. In spite of the high serum levels obtained with this antibiotic, only one observer has reported[6] convulsions in patients receiving carbenicillin. Both of these patients had severe azotemia.

In summary, it should be said that carbenicillin is a most promising addition to the therapeutic armamentarium in the treatment of infectious diseases. It is the drug of choice in the treatment of *Pseudomonas* and *Proteus* infections in patients with impaired renal function. It is also a satisfactory alternative to the aminoglycoside antibiotics in patients with *Pseudomonas, Proteus* and *Escherichia coli* infections who have normal renal function. When patients with severe gram-negative sepsis have failed to improve on accepted modalities of therapy, a clinical course of carbenicillin in high intravenous dosage should always be considered. Further clinical experience will be necessary to evaluate the efficiency of carbenicillin in the treatment of Bacteroides infections and in the concomitant use of carbenicillin and gentamicin in the treatment of severe *Pseudomonas* infections.

William J. Holloway, M.D.
William A. Taylor, M.D.

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SOME THOUGHTS ON MEDICINE IN 1971

Will the private physician and his patients be able to live with the coming changes?

The physicians on the staff of the Wilmington Medical Center and the physicians through their medical societies have had many meetings during the last three years concerning the site of the new hospital, prepaid care, and a medical school for Delaware. These discussions are mostly concerned with statistical reports, population trends for the future, and projected changes in health patterns. In some cases the physicians guiding the meetings and making major decisions are not private physicians but have full-time jobs. Their views on the health care of our patients are mainly statistical, and their viewpoints are more concerned with the structure of health care than the day-by-day practice of treating sick patients. The viewpoint of the private physician should also be considered.

One other consideration has encouraged me to speak out on this matter, ie, the building of the new prison in Smyrna. I recall the meetings held for five years prior to the decision. Each time we mentioned the needs of the prisoner, the difficulty in staffing, the difficulty in families visiting the prisoners, and the concept that the prison should be where the people are, we were always told that the planners, ie, the experts, thought that it should be in Smyrna. Now I hear people saying: "Why was the prison ever built in Smyrna? How will we ever get a staff down there to treat the prisoners? How will the relatives get to the prison? How will the prisoners get to the court?"

My further remarks deal with four general areas: The future course of the Wilmington Medical Center, prepaid medical care, community medicine, and a medical school for Delaware.

The Future Course of the Wilmington Medical Center

It now appears that a hospital will be built near Delaware Park on I-95. This would seem desirable and helpful to many people of New Castle County. It will also relieve a serious problem in the Newark area. If a quality hospital is maintained in the city of Wilmington, most objections to a suburban site are immediately neutralized. However, my interpretation of the events to date lead me to the conclusion that the I-95 site will be a medical-school, referral-type hospital and the site in Wilmington will be a city-type hospital.

This means that the private doctors of the county will then be divided into two staffs.

Most physicians will have to make a practical decision in which of the two hospitals they care to work to properly take care of their patients.

Many physicians who work at the I-95 site will move their offices to that location. This means, of course, the patients will then have to go from their homes to the doctor's office. When this involves a major (chronic) illness such as cancer, etc., this will be no problem. But for minor complaints, most patients will probably prefer a physician at one site or the other, not both. That is to say, the patient in Claymont with a nosebleed is unlikely to go to the I-95 site, and likewise the patient on Fourth Street with chest pains is unlikely to go to the I-95 site.

The quality of care at the two institutions will only be similar if both are kept as teaching hospitals. I am told by the Medical Department that we will not have the house staff or the teaching staff for two teaching hospitals. It seems that the medical school-type hospital will tend to have students, interns, and residents and the other hospital will not.

It is clear to me that the leaders of the Medical Center are all pushing for the I-95 site with very little momentum for the in-city site. For this reason, and not for the rationalized reasons, the decision has been made. I feel those pushing for a teaching-type, medical-school hospital at the I-95 site are so determined in this concept that they cannot see the alternatives. They are thus committing the state of Delaware to a fantastically expensive enterprise that we may not be able to afford. I feel it more realistic to build only a 200-bed hospital at the I-95 site, to expand the present Delaware Hospital for in-city, and to consider a third hospital near Concord Pike such as proposed by the American Institutional Developers, or others. This system would be the least expensive, the hospitals would be where the people are, two staffs would not be necessary, for Newark physicians would primarily staff the I-95 hospital, and the present physicians would staff the city hospitals and the hospital near Concord Pike. We would have something we could afford with equal quality medicine in all three institutions. Let us not fear a private hospital. Competition is healthy.

Prepaid Medical Plan

A prepaid medical plan has much in its favor; we must help our patient with the economics of medicine. I differ with the present concept in two ways: (a) it encourages quantity medicine, not quality, ie, the more patients you see the more you make; if you spend more time with your patients, you lose financially. This is a terrible position for a physician to be maneuvered into. It also leads to my second objection, (b) the cost. Prepaid care is put forth as saving; I say that it will cost more. All problems will be referred to subspecialists because the primary physician will no longer be paid for delving into these problems and will refer them to the subspecialists who will increase in number and increase the total cost of patient care. Only a prepaid system that preserves the quality of patient care should be supported.

Community Medicine

The Wilmington Medical Center has a financial crisis. It no longer can afford clinics such as the Drug Abuse Clinic unless they are 100% paid by outside sources. The Medical Center must maintain its financial integrity, but this presents a dilemma for the health needs of the patients who are crying out for more hospital involvement in community medicine and in areas such as alcohol and drug abuse at the same time that the hospital is retrenching in these areas. This means that unless the city and state governments take up this vacuum, the patients will have fewer programs and less assistance in this vital area. At the present, this to me is a dilemma which has no easy answer. With the city and state governments in a financial crisis also and unable to give quality care in the State Hospital and other areas, how can they get involved in the area of community medicine? We must work out a compromise based on the triangle of the Wilmington Medical Center, the city and state governments, and the physicians.

A Medical School for Delaware

Is it realistic to plan for a four-year medical school for the state of Delaware? If the University of Delaware through existing facilities can maintain a good premedical program and continue its work in relationship with Jefferson Medical School, I question that this state needs a four-year medical school. Thus, if Jefferson takes our Delaware students for their first two years and the Wilmington Medical Center for their last two years, their internship and their residency, why should we subject the state of Delaware to a very expensive four-year program? And, if we do not need a four-year medical school, this is also a reason why we should not build a giant hospital at the I-95 site.

These are my worries on our future and the type of medicine we will have in our state as 1971 starts. These are the subjects that my colleagues in private practice and I discuss each day. Any of you could have written what I have said, but let it not go unsaid.

William J. Vandervort, M.D.

* * *

A CASE AGAINST A PARASITIC HOSPITAL

The parasitic organism depends on someone else for its existence or support without making a useful or adequate contribution in return. More often than not, the parasite grows by taking its nourishment from its host and may thus cause the host actual injury by sapping his strength. The physician recognizes many different forms of parasitic diseases; in most cases the disease-weakened host is treated by eliminating the parasite.

Recently New Castle County has been approached by a glimmering and attractive new type of parasite which has already begun to spread its infection throughout the community, almost totally unrecognized as a danger by the unsuspecting host population. I am referring to the medical complex proposed to provide low cost medicine in comfortable surroundings with group type practice, open staff, extensive ambulatory and inpatient facilities. This hospital proposes to locate itself in wealthy north Wilmington.

No one could be against their service proposals except, perhaps, for their location. However, let's look at the fiscal side of the ledger. How can this proposed hospital afford to operate more cheaply? The answer is not that it has great secrets of administration which allow it a more efficient operation. The answer is related not to the things the hospital *will* do, but the things it *will not* do. By taking care of only the not-so-sick and by not admitting or by transferring major surgical cases or severely ill medical patients, this cottage-type hospital would supply only limited and less costly facilities. The difficulty with such an approach is that many surgical procedures start out simple and then become complicated, and when this happens the patients suffer if they are in the wrong hospital to have major problems taken care of. The same is true of many medical illnesses in which the patients may be in no condition for transfer. This, therefore, means that such a hospital although comfortable and lovely can actually be dangerous for the few unlucky patients who have complications.

Any hospital can obviously make money if all its bills are paid. In this present day and age most people are insured, but many not fully, so that a part of their bills must be self paid. Unfortunately, there is still a large segment of the population which has difficulty paying the uninsured remainder. A hospital in which these patients will be refused admission becomes a rich man's hospital, and by this definition not a community hospital as it does not draw from all segments of the community.

The effect of siphoning off the paying patients and the more profitable minimum care hospital operations would be to cause the other hospitals to have a higher percent of their patients in the seriously ill category and hence an unbalanced economic base. This will eventually cause room rates to go up in the community hospital, while they remain low in the parasite.

In many cities there is often a county or city hospital in which all of the indigent load is supported totally by the state. In such a setting, or in a large city with many hospitals, the parasitic "cottage hospital" may go relatively unnoticed. But as the state of Delaware gradually increases its contribution towards the community hospitals as remuneration for indigent care, any rise in hospital cost will be reflected by an increase in taxation. At present, most of our hospitals are seeking federal and state aid of many different types. However, for many types of funding the law requires that the hospital show proof that it is supplying care to all elements of the community. How then can a hospital which does not do so survive? By proving itself such a money maker throughout the country that it is backed by outside financial giants such as insurance companies. It does not intend to develop a community program and need federal or state help. Furthermore, the profits from its operation all leave the state as return to the corporate investors.

The pressures for lowering the cost of medical care are so great that, given time, it seems reasonable to believe it will be difficult to keep commercial interests such as insurance companies from building a profit-making hospital in this community, unless the hospitals which are presently here can demonstrate to the insurance company that there are no profits to be made in the hospital business in New Castle County. To do this may be difficult, but I believe it is quite possible. The most obvious solution is for the Wilmington Medical Center to include equivalent facilities as part of its new medical complex on the I-95 site. These would have the advantage of a more central location for all the citizens of New Castle County, not merely those of northern Wilmington. It would also mean that those patients with relatively simple medical needs would not have to pay overhead for the more complex problems, but should this type of complication arise, the patient would already be in an institution capable of taking care of all his emergency needs. At the same time, profits made in the lesser-care areas could be used to offset the deficits of the more intensive care areas.

Most of the ingredients of the proposed proprietary medical center are already in the planning process at the WMC for the I-95 site. Hopefully, the threat of the interloper will be enough to encourage the WMC to complete its plans rapidly and to announce them clearly to the public, so that the probable advantages for an outside firm will be so minimal that it will move on instead to a larger city where its profits would be secure and its effects less disruptive.

What we don't need in this day of merging hospitals is another medical center spreading physicians' patients out even farther and parasitizing the already shaky financial base of our existing hospitals.

R.B.F.

* * *

GENETIC CAUSES OF PEDIATRIC DEATHS

The causes of death in the pediatric age group are usually categorized as due to accidents, infections, obstetrical conditions, congenital malformations and miscellaneous conditions including tumors. In an interesting analysis Roberts et al[1] at the University of Newcastle upon Tyne have addressed themselves to the problem as to how many pediatric deaths might be due to genetic causes. It had been previously found in 1914 when two thirds of all deaths were essentially preventable and due to a variety of infections, that only 16% were due to wholly or partly genetic causes. In 1954 when deaths due to preventable causes had dropped to 15%, over one third were due to wholly or partly genetic causes. In the years 1960 to 1966 there were 1,041 deaths with data adequate for study analysis.

Single gene effects or diseases following the classical pattern of dominant or recessive inheritance were represented by 88 deaths, and 37 of these were due to cystic fiibrosis of the pancreas. Simple genetic diseases accounted for eight and one-half per cent of all deaths, and it is most interesting that 84% of these were recessive in character. A second category, chromosomal disorders due to a numerical chromosomal aberration, was responsible for 25 deaths with 22 of these representing Down's syndrome or mongolism. A third category included disorders that are probably of complex genetic etiology. These are diseases considered genetic because of their familial occurrence and to which the term multi-factorial or polygenic has been applied. It is represented by such diseases as spina bifida, some congenital heart disease, and forms of hydrocephalus. This category numbered 326 and was responsible for the majority of deaths in the series with disorders of the central nervous system being the most frequent. When one totals the deaths due to simple genetic diseases (8½%), due to chromosomal aberration (2½%), and due to multi-factorial etiology (31%), it is seen that a significant number of disorders can be attributed to genetic or partly genetic causes and may account for 42% of childhood deaths.

The importance of genetic counseling, particularly in regard to those diseases which are fatal in early life or lead to chronic handicapping conditions and death later in childhood, usually by secondary infection, is well accepted. Genetic counseling is practiced either by the individual physician or in the genetic clinics that are being established over the country in university and medical centers.

A generous grant from the Delaware Junior Board has recently made it possible to establish a Genetics Clinic and Cytogenetics Laboratory in the Wilmington Medical Center. A great stimulus to prenatal diagnosis and a further extension of our ability to counsel families is the ability to culture cells from amniotic fluid, a procedure that is usually carried out at the 12th to 14th post-conceptional week. Following a three-week period necessary for a cell culture to be established, it is possible, for instance, to inform a family whether or not the mother is carrying a fetus with Down's disease.

It is exciting, too, that another potential use of amniocentesis to aid genetic counseling will be in the group of diseases due to inborn errors of metabolism such as galactosemia, the Lesch-Nyhan hyperuricemia syndrome, etc. Some of these diseases are being diagnosed by the absence of enzymes present in cultured or uncultured amniotic fluid cells. Inasmuch as sex of the fetus is easily determined from amniotic fluid cells, this technique will obviously be of great aid in the counseling of carriers of X-linked conditions.

The potential value of amniocentesis as a screening value in lowering the instance of patients born with Down's syndrome is already apparent and, as Carter[2] has noted, the opportunity to use preventive pediatrics even in the antenatal period is here.

We can never really expect to eliminate or prevent all genetic disorders, but it will be of interest to await the impact of these advances in genetic counseling on the causes of deaths in the pediatric age group.

H.R.

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1. Roberts DF, Chavez J and Court SDM: The genetic component in child mortality. Archives of Disease in Childhood 45:33, 1969.
2. Carter C: Antenatal paediatrics by amniocentesis. Archives of Disease in Childhood 45:157, 1970.

ANOTHER LAPEL BUTTON

It's an era of buttons, buttons pro and buttons con, love buttons and hate buttons, war buttons and peace buttons.

Above is a replica of a clever new one, intended for men who've had vasectomies and who wish to proclaim the fact with a lapel pin.

Vasectomy as a method of birth control is increasing in popularity in the USA (woman's liberation?). One referral service, the Association for Voluntary Sterilization, reports it has received over 5000 requests for "v.s." (voluntary sterilization) through the first nine months of 1970. This compares with 3700 in 1969 and less than 2000 in 1968. Almost half of the men requesting v.s. had incomes over $10,000; 44% were college trained.

In India, where 50% of the world's vasectomies have been performed, *six million* Indian men have to date had vasectomies, and the total is expected to reach *35 million* by 1980.

Anyone who wants one of the v.s. pins which is gold finished with blue enamel trim (what else?) may have one for $1.00 from the Association for Voluntary Sterilization, 14 West 40th Street, New York City.

B.Z.P.

President's Page

THE NATIONAL PRAYER BREAKFAST

Reporting to the Medical Society events that impress or seem rewarding is a duty. Duty became a pleasure and an emotional uplift on February 2, 1971, when my wife and I were guests of the United States Congress and the President of the United States at the annual National Prayer Breakfast. The setting was in the International Ballroom of the Washington Hilton Hotel. Three thousand people were gathered at breakfast, linked together in respectful prayer to their Lord.

The gathering of worshippers was from all walks of life, businessmen, artisans, engineers, pilots, soldiers, sailors, doctors, lawyers. Represented were all fifty states of the Union and one hundred foreign countries. From Delaware were Governor Russell W. Peterson, Dr. H. Thomas McGuire and Dr. and Mrs. Henry H. Stroud.

To imagine the picture of a room full of people of different races and disciplines praying together and eating together with respect for their God and each other, would have been impossible. It was the vision and positive action of Abraham Vereide that made the National Prayer Breakfast a reality. In the early 1930's, Seattle, Washington, was in the grip of a crime syndicate. Faced with this picture, nineteen businessmen, who felt they were all good men, banded together, and condemned themselves for doing nothing. Reversing themselves, these businessmen got together regularly, first with prayer and then action, and the fate of Seattle changed. With this change, word of the prayer breakfasts spread along the West Coast. Led and inspired by Abraham Vereide, the National Prayer Breakfast was brought to Washington, D. C.

Mr. Vereide's method of influencing the members of Congress was to visit quietly in their offices offering counsel and aid where requested or wanted. In the dark days near the end of 1941, men of the Senate gathered at Wednesday breakfast to commune jointly with God and then discuss their current problems; the House members did the same at Thursday breakfast.

Congressmen in 1952 asked President-elect Eisenhower to lead in a National Prayer breakfast. This leads us to the event of this year, which was presided over by The Honorable B. Everett Jordan of the U. S. Senate, supported in music by the Milligan College Choir with the invocation offered by the Secretary of Labor, the Honorable J. D. Hodgson. The message, a personal interpretation of the Twenty-Third Psalm, was delivered by Chief Justice Warren Burger.

President Nixon offered remarks taken from Solomon's request of the Lord for understanding. The President prayed that "We as a nation receive from God understanding."

Our American Medical Association president, Dr. Walter C. Bornemeier, was responsible for the invitation given to the physicians of the nation to the National Prayer Breakfast. This example may be inspirational to our Religion and Medicine Committee to organize a prayer breakfast at our State Medical Society's annual meeting.

Rhodyn J Bishoff

Letters to the Editor

To the Editor:

Dr. McKusick's review of the little book* (DMJ, August 1970) was much appreciated. The first printing was for 5,000 copies, and the demand has exceeded our wildest dreams; over 50,000 have now been sold.

I wish the little book had stressed a certain point more. The point is this: at present, 2.1 children per US woman would, during the next couple of decades, lead to zero growth. We are now averaging about 2.5 per woman (more per *married* woman). Now 0.4 (2.5-2.1 = 0.4) is about 20% of all births. All studies of unwantedness indicate a rate of 15 to 30%. Hence, there is a real probability that we don't need to scream about population. If we give every child the right to be *wanted* we will cure the quantitative problem, and help in the attack on delinquency. Screaming too loudly about population appears to have had two unhappy reactions. (1) Some Negro groups call it genocide. (2) Some fine people whose children would be a great asset have refrained from producing as many as they otherwise might have wanted to.

Japan has had a rate *below* replacement for ten consecutive years. They are now trying to raise their fertility to get a net reproductive rate of 1 (ie, 0 growth).

Hungary and Rumania have had rates below replacement. Rumania suspended their easy abortion law, whereupon the birth rate more than doubled within a year.

In summary, the US figures, plus the experience in Japan, Hungary and Rumania, make it seem that easy abortion is the cure for both unwantedness and the population problem. This would not hold true for backward, rural areas, where women have nothing at all to do except to be mothers.

So the moral issue is the choice between abortion and bearing an unwanted child. The right to be wanted seems to carry the necessary corollary of the right not to be born if unwanted. Those who say the fertilized ovum has a right to be born should, to be logical, worry about all the children never conceived. If maximum fertility were reached, as with the Hutterites, 10.5 children would be born per US woman, and we would have one billion population in the next generation.

Whatever the moral issue, women seem unable to control fertility without the supplemental weapon of abortion. When the perfect contraceptive is developed, the need for abortion will diminish.

Richard L. Day, M.D.

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*Who Shall Live? Man's Control over Birth and Death, Wang and Hill, New York, 1970.

To the Editor:

A recent case report calls attention to a young man with seasonal pollen allergy but no known egg or other food allergy, who, after flu vaccine, developed influenza-like symptoms followed in two weeks by meningoencephalitis from which he recovered.[1] It is because of my concern for episodes of this sort that I have given up routine inoculations with influenza vaccine. Somehow, no matter what they say, in my own experience of all these years, most allergy patients tolerate it poorly. I am extremely hesitant to give it to the emphysema patient or the border-line severely crippled pulmonary patient, for I have had several patients in whom I felt their conditions were aggravated following the vaccine. I favor the intradermal route, using small doses. (Tufts at Temple is also a proponent of this method.)

Not enough emphasis is made to all physicians that whenever an atopic individual is given any sort of a medicinal injection, even his routine hyposensitization therapy treatments, the physician must always "be prepared for the worst." This particularly applies to the atopic individual who is often given repeat slugs of penicillin for "colds"; these patients become more readily sensitized to penicillin than the rest of the population.

Charles M. Bancroft, M.D.

[1] Rosenberg GA: NEJM 283:1209, 1970.

To the Editor:

When the Medical Advisory Committee to the Division of Social Services (formerly the Department of Public Welfare) met in June, it marked the end of approximately eight years of progress and growth under the leadership of the committee's first chairman, Dr. William O. LaMotte, Jr., who was unanimously elected eight years ago at the committee's first organizational meeting. Inaugurating the much needed and long overdue medical care programs presented problems that appeared to be insurmountable. However, the moment that the chairman called the advisory committee meeting to order he instilled in the Committee a feeling of confidence which could only lead to success. The preliminary planning, conferences, consultations, meetings and voluminous drafts and proposals were innumerable, but at all times the chairman was available for guidance, counsel and advice.

Dr. LaMotte has set a standard of accomplishment which will be difficult to surpass, and he will, of course, be available to us for future guidance and counsel.

It is little known by the great number of Delaware citizens, who are the beneficiaries of the medical care programs, that it has been mainly through his expertise, vast knowledge of the voluminous and ever-changing laws, rules and regulations that we have been able to wend our way through this maze and work toward our goal of comprehensive, quality medical care for all our people.

It is therefore, with utmost sincerity and deepest appreciation that we must speak out in behalf of the Division of Social Services and all the citizens of our state who have benefited from a service that could not have been provided without the leadership of this humble, understanding and public-spirited physician.

A. Roke Lieberman, *Assistant Director*
Division of Social Services

To the Editor:

The Medical Society of Delaware's Task Force for a Comprehensive Prepaid Medical Care Plan is proceeding slowly. The problems are complex. We recognize that many physicians of good faith are not in sympathy with the specific plan presented so far. We hold no brief for the details of that plan and are ready to modify it. We recognize, however, that the problems of medical care in our state are pressing and demand solution.

Care has become complex; physicians, especially primary physicians, are in short supply and there is need to organize to make effective use of ancillary personnel; inner city and rural areas are under-supplied; existing clinics leave much to be desired and the hospital emergency departments have become the *de facto* physicians for much of our population. SMAC and the Northeast Center give evidence that physicians do care and are willing to work for solutions of the problem. But more concentrated effort on the part of more physicians is needed now.

The deluge of proposals before Congress on medical care plans gives warning that if we do not guide the solution to these problems, solutions will be dictated to us.

The leaders of local industry have for years given evidence by their work on hospital boards that they are sincerely interested in the health problems of the community. They are now exploring the possibility of working with the physicians of the state to set up cooperatively a comprehensive group prepaid medical care plan which will cover not only their employees and families, but also any individual in the state who wishes to participate. If we add to that proposal a provision for government payment of premiums on behalf of the indigent, then we shall have a workable comprehensive plan. When such a plan has been developed, it will be presented in full to the Medical Society of Delaware for approval.

Now is the time for physicians to register their support for this concept and to offer their ideas for ways to develop it, or now is the time for all good men and true to come to the aid of the party.

David Platt, M.D., *Chairman*
Medical Society of Delaware's
Task Force for Development
of a Comprehensive Prepaid
Medical Care Plan

Delaware Academy of General Practice

FLASH!

The Yarborough-Rooney legislation approved by both houses of Congress with only three dissenting votes was vetoed by President Nixon on December 26th.

The bill called for a three-year $225 million program to train family physicians. In vetoing the bill, President Nixon said he felt the bill was "unnecessary and represents the wrong approach to the solution of the nation's health problem."

It is difficult to comprehend this rationale when it is universally conceded that a major factor in the present emergency in the delivery of health care is the short physician supply, particularly the primary physician.

Plans are underway to reintroduce the proposal early in the 92nd Congress.

* * *

The plans for the establishment of a residency program in family practice was significantly advanced with the recent appointment of Dene Walters as the full-time Program Director of the Department of General Practice — soon to be renamed as the Department of Family Practice. Dr. Walters is the first full-time director to be selected by the Wilmington Medical Center.

It is contemplated that Dr. Walters will "bring" his private practice into the Medical Center, using it as a core for the residency training program.

The Delaware Academy of General Practice
requests the pleasure of your company
at its
Nineteenth Annual Scientific Session
to be held at 1925 Lovering Avenue, Wilmington
and the Dinner Dance to be held in the
Gold Ballroom of the Hotel du Pont
Saturday, March Twenty-Seventh, 1971

Luncheon: $3.00 per person
Dinner-Dance: $15.00 per person

Cocktails at 6:30 p.m.

NIDICOLOUS, NIDIFUGOUS, OR CLEVER?

One of the characteristic features of a shift in the direction of a longer period growth and learning is the development of parental care. If individuals are to learn a lot, it will pay the species to care for them and to guard them, either through parental action, or in some other way, against the results of the mistakes they make while overcoming the risks that they are learning to meet. Thus, among the birds, those whose brains are ultimately the most highly developed hatch in a very immature state and remain for a long time in the nest (nidicolous'). In the more 'primitive' orders of birds the young can look after themselves from an early date ('nidifugous'), but they never become very 'clever'.

J. Z. Young, *A Model of the Brain*, by permission of the Clarendon Press, Oxford.

GUIDELINES ESTABLISHED BY THE PEER REVIEW AND PROFESSIONAL EVALUATION COMMITTEE MEDICAL SOCIETY OF DELAWARE

Since April 1970 the physicians of Delaware have been developing county and state mechanisms for peer review and professional evaluation. The main thrust of this effort has been educational rather than disciplinary, to assure quality care at reasonable cost. Part of the educational aspect has necessarily included developing an understanding of the third party involvement in health care financing, and its effect on patterns of practice and health care delivery. Emphasis has also been placed upon the concept of medical necessity, its importance, yet its flexible interpretation in the art of medical practice.

It has been found desirable to develop some guidelines for the benefit of physicians, patients, and third parties, and so far the following eight guidelines have been approved on a county and state level:

Guideline No. 1 — In the case of a physician who is on an administrative salary in an institution and who in addition has some medical responsibilities to some of the patients who come under his administrative jurisdiction, he may bill for his medical care at the rate of two such visits per week. Beyond this, documentation for medical necessity would be required.

Guideline No. 2 — When a patient insists upon more frequent treatment than is felt necessary by that patient's physician, the situation develops where the patient and not the physician is directing the care for this patient. The physician should then inform this patient that the third party involved will be billed for services to the extent that he the physician feels are medically necessary and that services beyond this he may provide if the patient insists, but that such services will be the financial responsibility of the patient. The physician shall at the same time inform the third party which will directly contact the patient involved indicating that in the opinion of the attending physician the services in question are not medically indicated and hence are not covered.

Guideline No. 3 — When a physician examines or treats more than one patient in the same house during a house call, the physician should bill his usual house call fee for the first patient, but for one or more additional patients under those circumstances, he should bill at a level not to exceed the normal fee for an office visit.

Guideline No. 4 — If a patient in a hospital has been operated upon by an out-of-town surgeon and continuing medical care while in the hospital is indicated, it is proper for the family physician to be reimbursed for daily visits to this patient if he feels these are medically necessary. These daily visits, however, are not to exceed the normal length of hospital stay for the particular diagnosis in question, and visits beyond this would require documentation of medical necessity for further reimbursement.

Guideline No. 5 — If a hospital utilization review committee has determined that continued hospitalization for a given patient is no longer medically necessary, the attending physician should see the patient as frequently as desired, but third party payments to the physician should be for visits not to exceed every third day, or the minimum number of visits the hospital may require for a hospitalized patient.

Guideline No. 6 — When a pattern of practice is encountered in which a patient is seen in home or office more than four times a month for a period of three consecutive months, the medical necessity for subsequent such visits at that frequency must be documented by the physician.

Guideline No. 7 — While it is a recognized and accepted pattern of practice to perform periodic (annual) diagnostic re-evaluation of patients under regular treatment for some chronic diseases, the physician and his patient must not equate this service with a routine annual physical examination, which is not a covered service under Medicare.

Guideline No. 8 — The physician should not bill for any injections for medication which medical opinion considers to be equally effective by the oral route unless the reason for using other than the oral route is clearly documented by the physician.

In addition there are misunderstandings which have developed due to differences in longstanding Blue Shield philosophy in Delaware compared to imposed Medicare philosophy. For example, some years ago there developed a policy of paying for medical admissions to hospitals on a per diem basis for physicians' services, without any daily substantiation required for services rendered. Indeed the intent has been to pay for services rendered on a per diem basis whether or not services were indeed rendered daily. The excuse for this was that an equalizer was necessary to account for differences in services early and late in an admission period. There are those who might question an arrangement which develops the habit of expecting payment for services not rendered. Then comes Medicare which requires documentation on the chart before charges for daily visits can be reimbursed. Since audit is usually done in this regard only on long-stay cases, some physicians have been caught in this dilemma rather unwittingly. Which should we change? Until this problem can be solved, a tentative guideline is being proposed, subject to approval of the Social Security Administration:

In long-stay hospitalization cases where the physician bills on a per visit basis, while daily notes on the progress sheet from the inception would be consistent with good medical practice, documentation of the physician's visit by suitable notes on the progress sheet would be required after the 24th day if such visits are to be reimbursed under Medicare.

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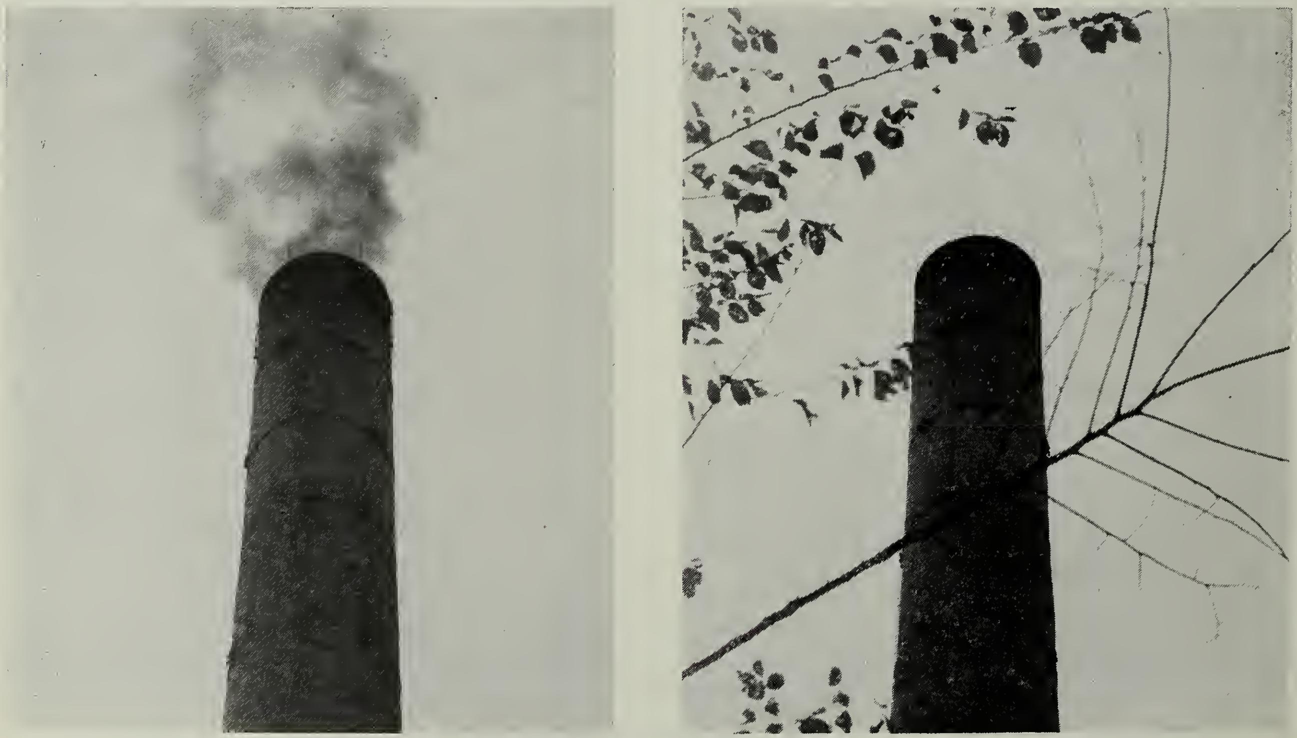

THE GREENING OF WILMINGTON

Smokestack, Memorial Division, WMC, photographed before and after installation of an anti-pollution incinerator.

Photos by Bob Swist

In Brief

Speakers on "Ask the Doctor"

Speakers for March 1971, on the Tuesday radio program (11:05 a.m. WDEL) produced by the Medical Society of Delaware are: March 2, C. Anthony D'Alonzo, M.D., *Alcoholism*; March 9, Edgar N. Johnson, M.D., *The Chronic Draining Ear*; March 16, Charles L. Miller, M.D., *Poison Prevention*; March 23, Howard A. Lovett, Jr., M.D., *Young Peoples' Attitudes on College Campuses Today*; March 30, Allen Davies, M.D., *Coronary Artery Disease*.

In the News

The newly created position of Deputy Director, Division of Physical Health, Department of Health and Social Services, has been filled by Edward F. Gliwa, M.D. of Newark, whose office will be in the State Health Building in Dover. Dr. Gliwa was formerly Deputy State Health Officer for New Castle County and will be replaced by Barbara Rose, M.D., who has been serving as Acting Deputy State Health Officer for the past few months. She previously served as Director of Chronic Diseases with the Division of Physical Health in Dover.

Wallace M. Johnson, M.D., Newark physician, received the Greater Newark Chamber of Commerce community service award at the Chamber's annual banquet, January 19, 1971. He was hailed for his medical service to the community, for serving without pay as doctor for Newark's volunteer fire department, and for his performance as former city councilman and mayor.

Cholera Vaccination Requirement

The PHS announces that cholera vaccination will no longer be required for travelers coming to the United States from areas infested with this disease, stating: "There is clear evidence that cholera vaccine is of little use in preventing the spread of cholera across borders. We have, today, excellent treatment for cholera. The only effective method for preventing its spread is improvement of environmental sanitation. The vaccine's only real benefit is to reduce morbidity and mortality in countries where health facilities for treatment are less than adequate. Cholera vaccination for countries other than the United States has not been changed and would still be administered according to each country's regulations."

Seminar Date Change

There has been a change in the date Dr. Lewis Barness will visit the University of Delaware in Newark. Instead of March 17, Dr. Barness will visit the University on Tuesday, March 23rd. He will speak on *Nutrition and Brain Development*. Mark this on your calendar.

New Computer Booklet Available

General Automation provides industry with a unique approach to automation projects with their "Glossary of Commonly Used Computer Terms." Write for information to: General Automation, Inc., 215 DeKalb-Pike, Suite EG4, King of Prussia, Pa., 19406. Telephone (215) 265-6525.

MLA Scholarships

The Medical Library Association is offering one $1,500 scholarship and the *Paul Jolowicz* scholarship of $1,000 to qualified students who will enter library school in the summer or fall of 1971. Applications are available from any ALA accredited library school, or from the MLA central office, Suite 2023, 919 N. Michigan Ave., Chicago, Illinois, 60611.

CLINICAL NOTICES AND MEETINGS

Cruise Seminar

The Department of Postgraduate Medicine of Albany Medical College announces that reservations are now being accepted for a spring postgraduate medical seminar cruise to the Mediterranean April 30-May 20, 1971. The 20-day cruise from New York aboard the luxurious and distinguished ship *Raffaello* (Italian Line) includes Casablanca, Naples, Genoa, Cannes, Barcelona and Lisbon as ports of call. Faculty of the Albany Medical College will present a comprehensive shipboard postgraduate program, covering subjects in internal medicine, cardiology, obstetrics and gynecology, pathology and surgery. Request has been made for continuation study credit by the AAGP. For information write: William P. Nelson, III, M.D., Department of Postgraduate Medicine, Albany Medical College, Albany, New York, 12208.

Clinical Center Studies

The cooperation of physicians is requested in the referral of patients for clinical studies being conducted by the National Cancer Institute's Solid Tumor Service at the Clinical Center, NIH, Bethesda, Maryland. Needed for these studies are patients with: Metastatic carcinoma of the ovary, widespread reticulum cell sarcoma, Hodgkin's disease, or lymphosarcoma. Of particular interest are previously untreated patients with these disorders. Upon completion of their studies, patients will be returned to the care of the referring physician who will receive a summary of findings. Interested physicians may write or telephone: Robert C. Young, M.D., Clinical Center, Room 4-B-13, NIH, Bethesda, Maryland, 20014. Telephone: (301) 496-2031.

Cardiology for Nurses

For those interested, *The Cardiac Nurse in the Seventies* will be held March 17-20, 1971 at Convention Center, Shreveport, Louisiana. Contact the Delaware Heart Association, Independence Mall, Wilmington, for further information.

Medical Education Administration

A two-day conference on Medical Education Administration will be held March 19-21, 1971 at Hotel Hershey, Hershey, Pa. AAGP, ACGP credit applied for, AMA credit-13 hours. Write to: Council on Education and Science, Pennsylvania Medical Society, 20 Erford Road, Lemoyne, Pa., 17043 for particulars.

Rural Health Conference

The 24th National Conference on Rural Health will be held March 25-26, 1971 at the Marriott Motor Hotel, Atlanta, Georgia.

ACP PG Courses

The American College of Physicians announces the following courses: *Recent Advances in Cardiovascular Diseases,* April 5-9, to be held at the Americana Hotel, 7th Avenue and 52nd Street, New York; *Clinical Pharmacology, with Emphasis on Newer Drugs,* April 19-21, The University of Michigan, Ann Arbor, Michigan; and *Alcoholism and Chronic Liver Disease,* April 26-30, Lemuel Shattuck Hospital, Boston, Mass. For further information write: Edward C. Rosenow, Jr., M.D., Executive Director, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104.

PG Course

The University of Pennsylvania School of Medicine announces a course on *The Small Bowel,* March 22-23, 1971. It will be an integrated course devoted to developing understanding of the mechanisms of small bowel disease. Tuition Fee — $75.00. For further information contact the Office of Graduate Medical Education, 288 Medical Laboratories Building, University of Pennsylvania, Philadelphia, Pa. 19104.

Socio-Economics of Health Care

The 5th National Congress on the Socio-Economics of Health Care will be held at Caesars Palace, Las Vegas, Nevada, April 2-3, 1971. The theme will be Current Issues in Medical Care Delivery. Write to the AMA for advance reservations.

The Hospital Library

As a partner of Medical Education, *The Hospital Library* will be the subject of a program to be held on April 14 at Hershey Medical Center, Hershey, Pa. It will be a one-half day conference for hospital chief executive officers, medical educators, directors of nursing education and in-service education directors. AAGP, ACGP credit applied for. AMA credit-4 hours.

Surgeons Meet

The American College of Surgeons will hold its final of three 1971 North American sectional meetings in the Hotel Queen Elizabeth, Montreal, April 5-7. The three-day program is open to all doctors of medicine. Reservation forms may be obtained by writing Mr. T. E. McGinnis, American College of Surgeons, 55 East Erie Street, Chicago, Illinois, 60611. No registration fee is charged Fellows of the College, members of the Candidate group, residents or interns who present letters signed by chiefs of surgery or hospital administrators. Non-Fellows pay $15; non-Fellows in the Federal Services pay $7.50.

Joint Cardiac Symposium

The 14th Annual Joint Cardiac Symposium of the Washington Heart Association and the Heart Association of Northern Virginia will be held at the Marriott Twin Bridges Motor Hotel, Persian Room, Arlington, Va., on Wednesday, April 7, from 9 a.m. to 3:30 p.m.

Postgraduate Symposium

The Department of Otolaryngology at the Jefferson Medical College of Thomas Jefferson University, Phila., announces a Postgraduate Symposium April 1-2, 1971 with the theme, *Therapy in Otolaryngology — 1971.*

Concentrating on both medical and surgical treatment in the broad area of Otolaryngology, it will include Otology, Rhinology, Sinus Disease, Allergy, Head and Neck Cancer, Trauma, and Maxillofacial Surgery. The registration fee of $50 for practicing physicians and $10 for residents will include lunches on both days, and a dinner meeting. Contact the General Chairman, William H. Baltzell, M.D., Department of Otolaryngology, Jefferson Medical College, 1025 Walnut Street, Philadelphia, Pa., 19107 for details.

Projects Approved by GDVRMP

A program of continuing education for physicians and allied health personnel in four Delaware hospitals has now been approved by Greater Delaware Valley Regional Medical Program (GDVRMP) and submitted to Regional Medical Programs Service (RMPS) for funding. These hospitals, located in the lower counties of Delaware, are Milford Memorial, Beebe, Kent General and Nanticoke Memorial. The institutions serve a population of 175,000.

Increasing demands on their time have made it difficult for most physicians to keep up with the rapid advances in medical knowledge. The problem is even more acute in rural and semi-rural areas isolated from major medical centers. Joining forces is an efficient way of meeting the problem. The proposal calls for employing a Director of Medical Education to conduct the program. First year costs are estimated at $56,175. In the second year the participating hospitals would pick up one third of the cost. In the third year they would assume two thirds of the cost. After the third year the program would be supported entirely by the hospitals. There are about 90 MD's and DO's in the area. Continuing education programs would also be planned for nurses, technicians and other paramedical personnel.

Training key groups to give emergency care is the subject of another approved project which would instruct fire and police personnel, ambulance squads and others in the care of people suffering cardiac or respiratory failure, in the use of manual and mechanical aids to sustain life until the hospital team takes over. The project calls for a traveling classroom. All equipment needed to teach the course would be installed in a special van which would travel to a location convenient to the students. About 250 training programs would be held the first year.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

ANESTHESIOLOGIST: Available July, 1971. Medical Education, India. American Residency. ECFMG. Fellow, American College of Anesthesiologists. Diplomate, American Board of Anesthesiology. Canadian license. Interested in organizing department or in intensive care.

THE FORUM
Environment And Health

AIR POLLUTION IS . . . .

N. A. Esmen, Ph.D.

The importance of air pollution control and the conservation of air resources have been amply publicized recently. In many cases, under different socio-political or technological contexts, the problems of air pollution have been either grossly exaggerated or grossly understated. If one is to understand the implications and meaning of air pollution, it is necessary to be aware of some prevalent misconceptions. Here are listed the most common fallacies:

1. "Air pollution is a threat to all human existence."

   WRONG. The levels of pollution predicted for even the worst areas without any control are such that the entire population exposed will not be affected critically. This, however, does not mean that air pollution is not harmful to health. People with respiratory problems, the sensitive, and the young and the elderly may be severely affected by the presence of high concentrations of certain pollutants.

2. "Air pollution is just an industrial phenomenon, and industry must pay to curb it."

   WRONG. In most geographic areas, pollutants from industrial sources are equal to or less than the pollutants produced by domestic heating and incineration, and by automotive and transportation sources. Furthermore since people demand (use) the products of industry, own shares of industry and derive any profits (or losses), as well as support by taxes all the levels of government, it is we individuals who must pay to remove pollution — by increased product costs, lower profits, higher taxes, etc.

3. "Air pollution is always visible; the more visible it is, the more dangerous the pollution."

   WRONG. One of the most dangerous and insidious pollutants is carbon monoxide, a colorless, tasteless, odorless gas. On the other hand, black smoke coming from a chimney may have a fairly low concentration of small carbon particles and, as it is dispersed by the atmosphere, it will not only be harmless to health but it may not be more than an esthetic nuisance.

4. "Air pollution is solvable by legislative action."

   WRONG. In recent years there has been a passionate demand for federal, state and local legislation against air pollution. Although through legislation one can obtain certain weapons against flagrant violations of the air, the major step in controlling pollution can and will come through re-education of the public to think in terms of living within the environment instead of against the environment. Also needed is a redirection of technological development in order to give products and devise processes which will operate in harmony with the environment.

This short list of common fallacies is not complete by any means. However, as the list grows, the subject becomes more technical, and in some cases, the answers more controversial. The hope remains that in the near future we will be able to tackle more sophisticated and complex problems of air pollution, with the simpler ones solved.

Dr. Esmen is Assistant Professor of Civil Engineering at the University of Delaware. His specialty is air pollution control, and his position at the University is supported by the Delaware Tuberculosis and Health Society.

This page is sponsored by the Delaware Tuberculosis and Health Society.

Delaware
Medical Journal

MARCH, 1971
VOLUME 43
NUMBER 3

SURGICAL MANAGEMENT OF MOTILITY DISTURBANCES OF THE ESOPHAGUS AND CARDIA

• **Appropriate surgery of the esophagus is related to a knowledge of esophageal physiology as enhanced by recent clinical techniques.**

F. Henry Ellis, Jr., M.D., Ph.D.

Although surgical advances in the past 20 years have made it possible to carry out a wide variety of extensive operations on the esophagus with relatively low mortality and morbidity rates, similar advances in our basic understanding of the function of the esophagus are of more recent origin. Improved techniques of investigation, such as the use of esophageal manometry and cinefluoroscopy, have now provided us with a fund of new basic information that makes it possible for the surgeon to plan his operative procedures physiologically with a high expectation of therapeutic success. Before discussing those conditions characterized by an abnormality in function, which are amenable to surgery, some details of normal esophageal physiology should be stressed.

Normal Esophageal Function

The function of the esophagus is to convey material from the pharynx to the stomach and sometimes vice versa. Mechanisms are located at either end of this tube to prevent easy access of air from above and gastric contents from below. The essentials of esophageal function are thus very simple. In detail, however, they are both complex and controversial. Employing techniques of esophageal manometry developed primarily in the laboratories of Code[1] of the Mayo Clinic and Ingelfinger[2] of Boston, the details of normal esophageal function have been clarified.

At the upper esophageal sphincter, a band of elevated pressure about 2.5 cm in length is found under resting conditions. The mean maximal pressure in this region is about 40 cm of water more than esophageal pressure and an equal amount more than pharyngeal pressure. At the beginning of deglutition, elevated pressures are developed in the hypopharynx accompanied by relaxation of the upper sphincter. The sphincter immediately contracts thereafter, and the primary peristaltic wave of the esophagus is initiated. This wave traverses the body of the esophagus in a uniform fashion, the intensity of the pressure of

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Dr. Ellis is with the Department of Thoracic and Cardiovascular Surgery, Lahey Clinic Foundation, Boston, Massachusetts.

This paper was presented in part at the Wilmington Medical Center, May 16, 1970.

the waves varying between 15 and 100 cm of water. Pressure records from the esophagogastric junction show that the band of elevated pressure at the cardia, the so-called inferior esophageal sphincter, is abolished about two seconds after swallowing is initiated. This relaxation of the lower end of the esophagus is followed by a wave of high pressure as the peristaltic wave rolls through the sphincter. (Figure 1) Although there remains considerable controversy as to the true nature of the gastroesophageal sphincteric mechanism, most students of the subject believe that the inferior esophageal sphincter, which can be demonstrated physiologically if not anatomically, is the major mechanism protecting the lower esophagus from reflux of gastric contents.

Disordered Esophageal Motility

Disorders of esophageal motility are difficult to classify. One classification, presented in Table 1, separates these abnormal motility patterns into those characterized by hypomotility, those characterized by hypermotility, and those characterized by incoordination. A miscellaneous group would include those abnormalities that do not readily fit into any of the preceding ones.

Esophageal Achalasia

Esophageal achalasia is a motility disturbance characterized by hypomotility in which the symptoms are primarily caused by failure of the lower esophageal sphincter to relax during swallowing. In addition, there is loss of peristalsis of the body of the esophagus. Practically all patients complain of dysphagia, which may at first be intermittent but becomes constant as the disease progresses. Pain is a relatively infrequent symptom, which, when it occurs, is usually present only in the early stages of the disease, becoming less prominent as the esophagus dilates.

The earliest roentgenographic sign of cardiospasm is that of obstruction at the cardia with slight proximal dilatation of the esophagus above. (Figure 2) As the disease progresses, the classic roentgenologic signs develop. The esophagus becomes more and more dilated reaching huge proportions at times so that it may even occupy a major portion of the right pleural space.

Table 1

Disorders of Esophageal Motility

- Hypomotility
  - Achalasia of the esophagus
- Hypermotility
  - Diffuse spasm
  - Hypertensive gastroesophageal sphincter
- Incoordination
  - Pharyngo-esophageal diverticulum
- Miscellaneous
  - Sliding esophageal hiatal hernia

Studies of esophageal motility demonstrate a lack of coordinated peristalsis in the body of the esophagus and failure of relaxation of the lower esophageal sphincter. (Figure 1) Resting pressures at the sphincter are normal in most patients, so with rare exceptions there is no spasm in "cardiospasm," and the term esophageal achalasia is the appropriate one.

Treatment is designed to relieve the lower esophageal obstruction because, at the present stage of our knowledge, nothing can be done to restore peristalsis to the body of the esophagus. For many years forceful dilation has been employed in the treatment of this disease, and there are still those who prefer it as a primary form of therapy. Using hydrostatic dilations, Sanderson recently reported on 456 patients treated at the Mayo Clinic between January 1, 1950, and January 1, 1968.[3] Of these patients 81 percent were considered improved by surgery; of these 65 percent had excellent or good results, and 16 percent fair results. Nineteen percent were judged unimproved or worse. This form of therapy is not without complications, 4.5 percent experiencing significant problems after treatment, most of which were due to rupture of the distal esophagus during dilatation.

Those surgical procedures that destroy or

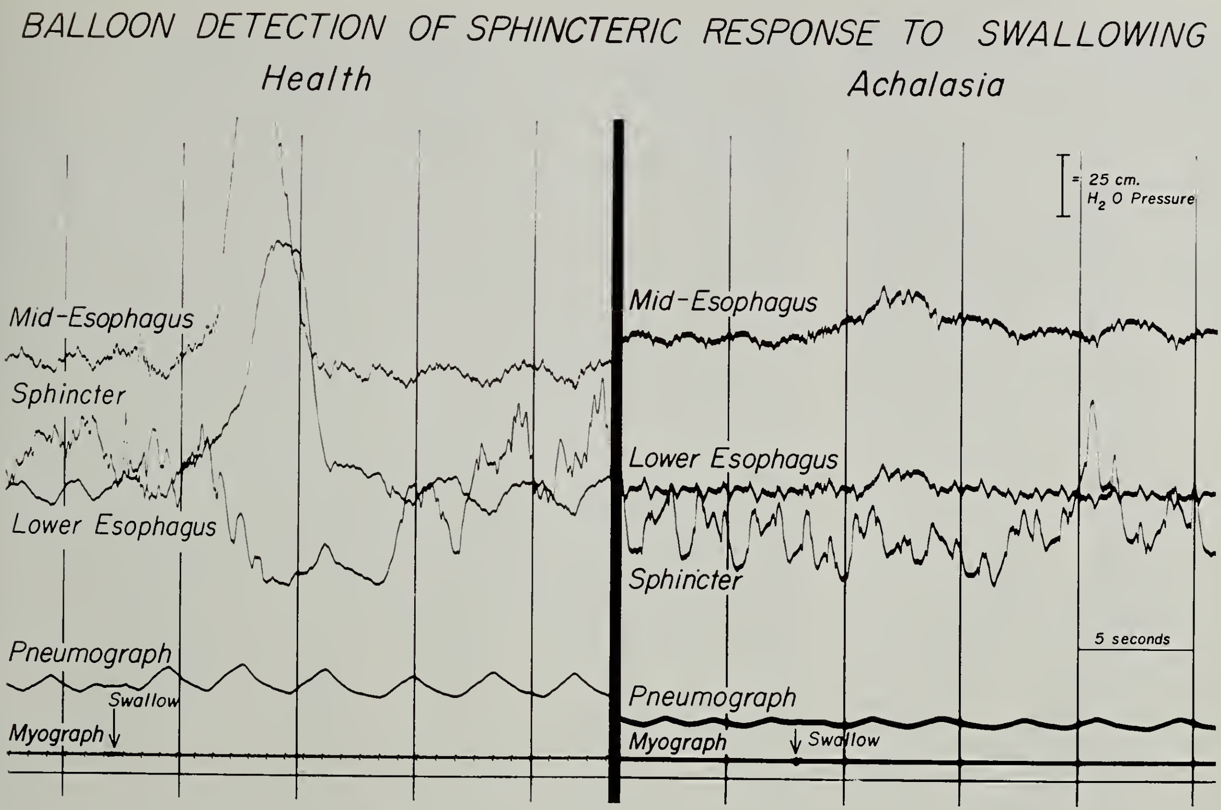

Figure 1 Esophageal motility records in response to deglutition in health (left) and an achalasia (right). Note the orderly peristalsis in the body of the esophagus with relaxation of the sphincter in health contrasted with the feeble simultaneous esophageal contractions and no sphincteric relaxation in achalasia. The esophageal contractions are excessive in magnitude and duration in diffuse spasm, but sphincteric relaxation occurs.

(Ellis FH Jr. et al: Surgery 48:159, 1960.)

bypass the esophagogastric junction, including esophagogastrectomy and the various cardioplasties, have led almost uniformly to the development of severe and sometimes fatal esophagitis and therefore should be abandoned. In 1913 Heller described an operation involving two myotomies of the distal esophagus and cardia performed through the abdomen, and modifications of this procedure are currently preferred by all who advise surgery in the treatment of this disease.[4] Figure 3 illustrates a modification of the Heller myotomy that I have found to be successful in a high percentage of patients on whom it is used. A thoracic approach is preferred with careful longitudinal incision of the distal esophageal musculature with lineal extension onto the stomach. Care is taken to avoid damage to the vagus nerves and to restore the hiatal anatomy to normal if necessary. If properly performed, esophagomyotomy carried out in this fashion should not lead to gastroesophageal reflux, and postoperative esophagitis should be a rare complication. My colleagues and I performed 369 such operations between January 1949 and January 1970. There was one hospital death. Ninety-six percent of the surviving patients operated on before January 1967 were improved by the operation, 83% having either excellent or good results.[5] I now consider esophagomyotomy as the primary treatment of choice for the patient with symptomatic esophageal achalasia. It should be performed early in the course of the disease. Forceful dilation should be reserved for those patients whose condition for one reason or another is such that major operation is contraindicated.

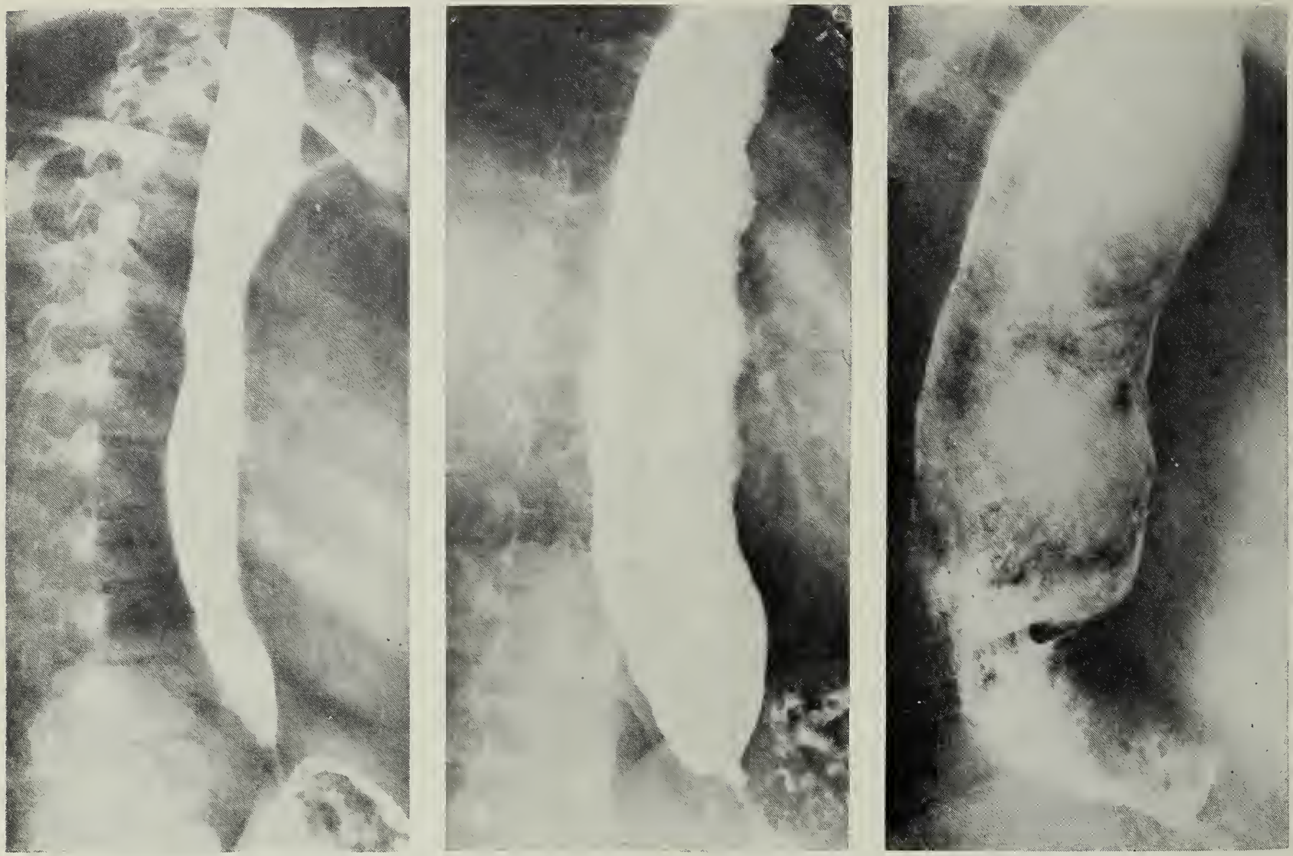

Figure 2 Appearance of esophagus in different stages of esophageal achalasia.
(Ellis FH Jr, et al: JAMA 166:31, 1958.)

Diffuse Esophageal Spasm and Hypertensive Gastroesophageal Sphincter

Diffuse spasm of the esophagus is a disorder of esophageal motility characterized by hyperactivity, as is the less common condition of hypertensive gastroesophageal sphincter. Pain and dysphagia are the predominant symptoms, with pain being more pronounced and dysphagia occurring intermittently or not at all. The pain varies from a sensation of discomfort beneath the lower half of the sternum to severe colicky substernal pain extending through to the back, the tips of the scapulae, and into the neck or shoulders. It may in fact mimic cardiac pain. Although eating may provoke an episode, it may and usually does occur spontaneously, often awakening the patient at night. Although it has been our experience that roentgenography of the esophagus will sometimes show normal findings in patients suffering from these disorders, the appearance is occasionally such as to explain the use of such terms as pseudodiverticulosis, functional diverticula, segmental spasm, curling a corkscrew esophagus, and so forth. (Figure 4) Epiphrenic diverticula and small diaphragmatic hernia may coexist.

A definitive diagnosis can best be made by esophageal manometry. Patients with diffuse spasm demonstrate simultaneous, sometimes repetitive, and prolonged contractions of excessive magnitude in the lower half or third of the esophagus after swallowing. (Figure 1) The sphincteric response, however, is quite normal, differentiating the condition from esophageal achalasia and confirming the fact that it is not an early stage of esophageal achalasia. In patients with hypertensive gastroesophageal sphincter, the pressure in the sphincter is excessive, being higher than 140 cm of water as detected by the balloon-covered transducer.

Treatment of these hypermotility disturbances is difficult, and medical management is

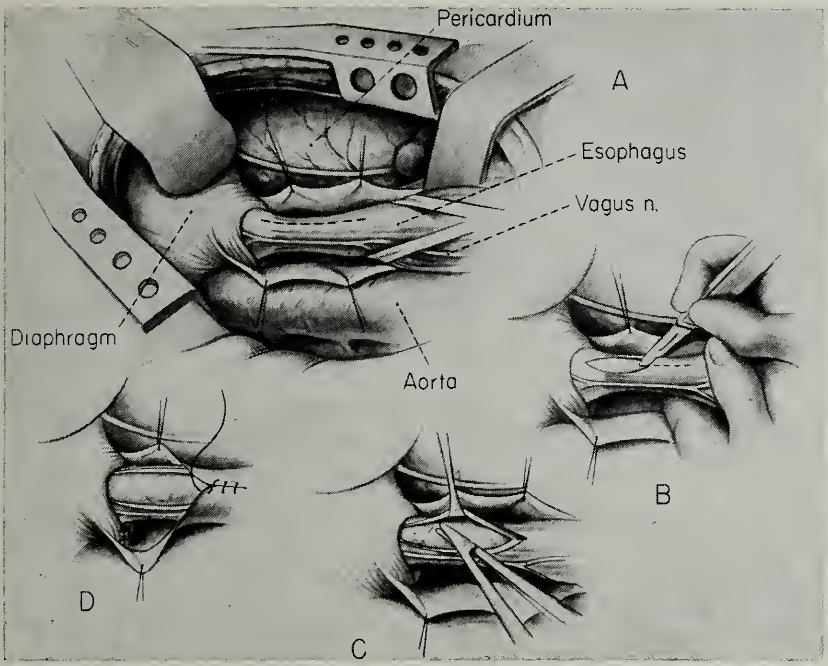

Figure 3

Technique of esophagomyotomy. A, Operative exposure. Dotted line indicates intended line of incision. B, Beginning the incision. C, Dissection of mucosa from muscularis. D, Restoration of esophagogastric junction to intra-abdominal position with suture narrowing of esophageal hiatus if necessary.

(Ellis, FH Jr, et al: Ann Surg 166:646, 1967.)

often ineffective. As early as 1950, Lortat-Jacob of Paris carried out a long esophagomyotomy on a few patients suffering from what he called diffuse nodular myomatosis, a condition that in many ways resembles the motility disorder under discussion.[6] Although unaware of his work, we were impressed by the hyperactive nature of the motility disturbance in its relatively localized form, and some years ago began to carry out an extended, modified Heller myotomy procedure in patients with severe symptoms. The technique of the operation resembles in most respects that employed for esophageal achalasia. (Figure 5) The esophagus again is exposed through a left thoracotomy incision, and a myotomy is performed with complete incision of the distal esophageal musculature. The approximate extent of the incision varies, depending on the preoperative estimate of the length of the diseased portion of the esophagus, occasionally extending as high as the arch of the aorta. Because a small diaphragmatic hernia frequently coexists, its repair becomes an integral part of the procedure. Associated phrenic diverticula, which are not uncommon, should be excised at the same time. Of 40 patients so treated, 78 percent were considered to be improved, while 22 percent had poor results.[7] These results are clearly less good than those after esophagomyotomy for achalasia, so one must be more selective in picking out the ideal candidate for the operation. On the basis of my experience, I would consider the ideal surgical candidate to be someone possessing most or all of the following attributes. The patient should be emotionally stable and have serious disability from the disease without evidence of associated gastroenteric disease. There should be objective evidence of severe disability in the form of markedly abnormal esophageal motility pattern, associated ideally with radiographic evidence of esophageal spasm, esophageal diverticula, or both. A long esophagomyotomy in such a patient should be accompanied by a high percentage of favorable results.

Pharyngo-esophageal Diverticulum

Evidence has recently been presented that suggests that incoordination of pharyngo-esophageal function may be responsible for the development of some pharyngo-esophageal diverticula.[8] This condition, long considered an anatomic defect of uncertain etiology, has been considered by some to be the result of "cricopharyngeal achlasia."[9] However, esophageal motility studies have failed to demonstrate lack of relaxation of the cricopharyngeal muscle in patients with pharyngo-esophageal diverticulum. Rather, an abnormal tem-

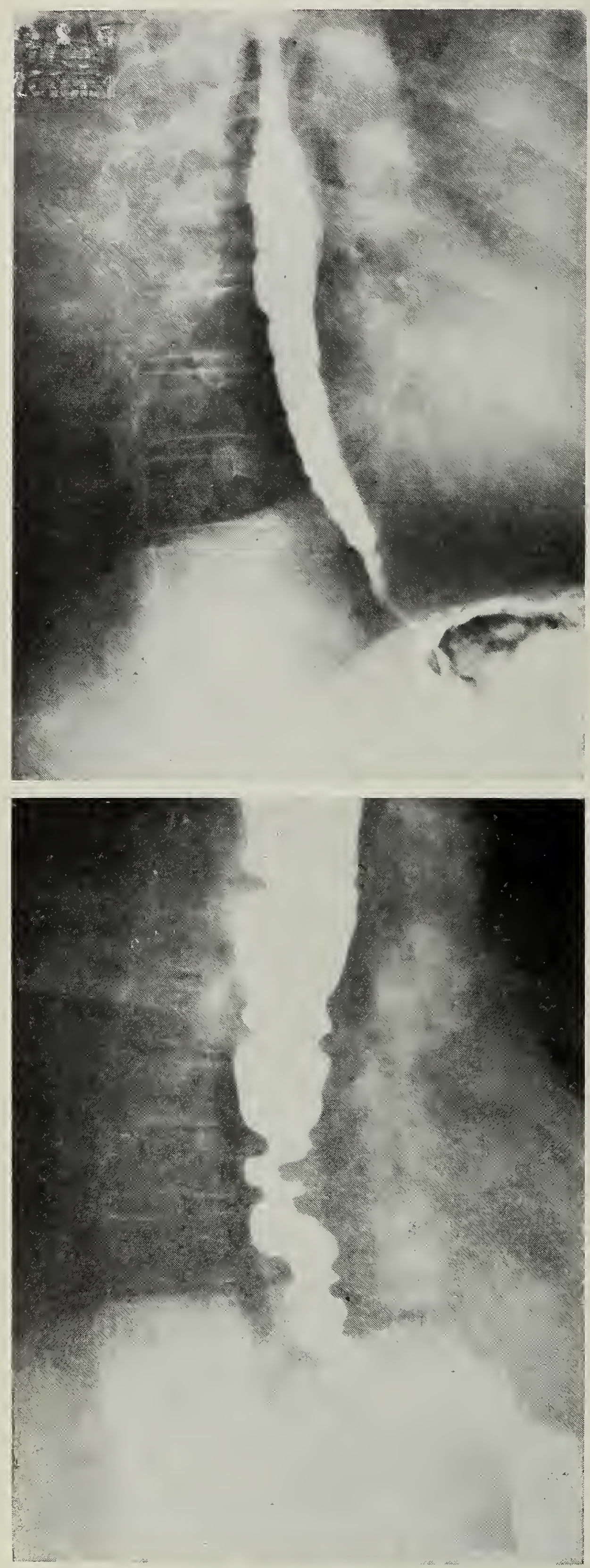

Figure 4 Esophageal roentgenograms in patients with diffuse spasm.
(Olsen AM, et al: J Thoracic Surg 22:165, 1951.)

poral relationship between swallowing responses in the pharynx and sphincter was identified. The abnormality is characterized by the occurrences of sphincteric contraction before completion of pharyngeal contraction. Surgical section of the cricopharyngeus muscle has proved to be an effective alternative to diverticulectomy in the management of patients with small to moderate sized pouches. Of 18 patients so treated, the diverticulum had either disappeared or had become markedly smaller at follow-up roentgenographic examination. Symptomatic improvement paralleled the favorable radiographic response in every instance.

Sliding Esophageal Hiatal Hernia

A common motility disturbance of the esophagus is that occasioned by the development of a sliding esophageal hiatal hernia. In this condition, the esophagogastric junction moves through the esophageal hiatus into the posterior mediastinum so that it occupies an intrathoracic position cephalad to the fundus of the stomach. Normal esophageal length and absence of fixation permit easy return of the displaced structures into the abdomen. The function of the esophagogastric junctional area is altered under these abnormal anatomic conditions, which include widening of the esophageal hiatus, stretching of the phrenoesophageal ligament, and loss of the acute angle of entry of the esophagus into the stomach. The elevated pressure zone of the inferior esophageal sphincter is shorter and of lower amplitude than when normally located. The reasons for this are not entirely clear. One is forced to conclude that the supporting structures about the hiatus must contribute substantially to the normal mechanism. That the loss of the acute angle of entry is not the main cause of gastroesophageal reflux in the presence of an esophageal hiatal hernia is evident from the fact that not all patients with hiatal hernia have reflux, since the angle is lost in practically all. Rather, the presence or absence of reflux is related closely to the magnitude of the pressure barrier at the sphincter. When the pressure at the sphincter exceeds that at the hiatus, the contents of the supradiaphragmatic portion of the stomach will

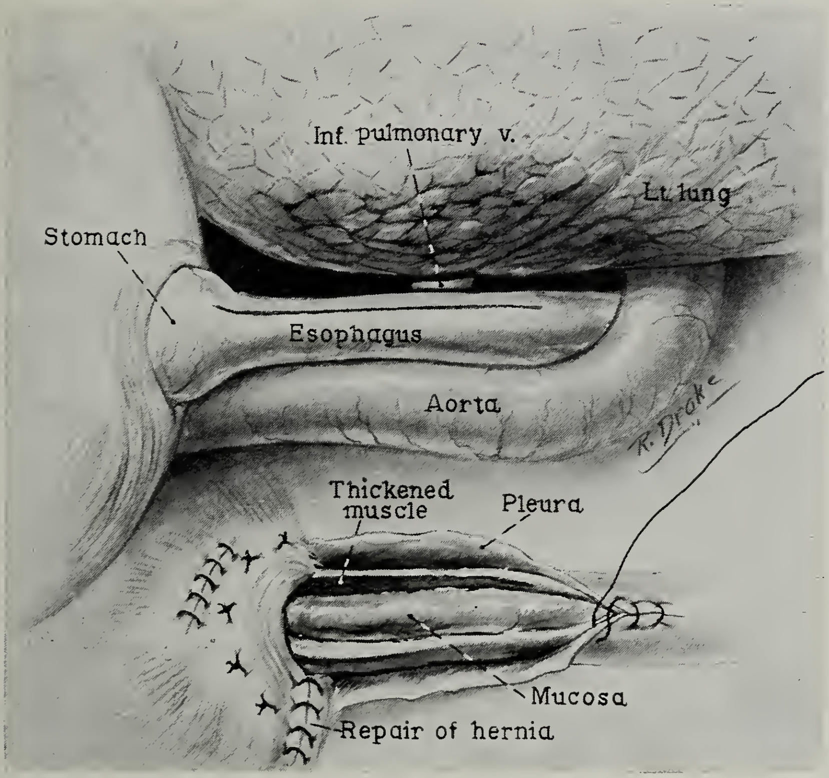

Figure 5
Technique of long esophagomyotomy and repair of hiatal hernia employed in treatment of diffuse esophageal spasm.
(Ellis, FH Jr, et al: Surgery 48:162, 1960.)

empty into the main portion of the stomach below the diaphragm. When the opposite is true, gastroesophageal reflux is facilitated.

Under most circumstances, surgical reduction of the hernia will restore gastroesophageal competence without the necessity of performing any ancillary procedures on the esophagogastric junction. The surgeon's main effort, therefore, in repairing a hiatal hernia should be to restore normal anatomy as nearly as possible and to prevent recurrences. Failure of the operation is most often associated with a recurrent hernia, and gastroesophageal reflux rarely persists when the hernia remains reduced.

There are, however, some individuals who have an intrinsically weak sphincter, which, even when restored to its normal location, is not of sufficient magnitude to prevent reflux. These patients can usually be identified preoperatively by esophageal motility studies. In such instances, mere reduction of the hernia may not be adequate, and an ancillary procedure to reinforce the sphincteric mechanism must be performed. I have been pleased with the results of the Nissen fundoplication operation under such circumstances and continue to use it when the situation demands. The operation is easily combined with abdominal reduction of the hernia and narrowing of the right diaphragmatic crus posteriorly and, if carried out over an indwelling nasogastric tube of large caliber, does not result in obstruction to the passage of food.

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BLUE SHIELD'S PARTNERSHIP WITH MEDICINE

• The demands of the public for more comprehensive health insurance are a reality of present medical socio-economic life. The situation is here reviewed by the Chairman of the Board of the Massachusetts Blue Shield.

George Dunlop, M.D.

Almost every doctor today will admit that we are facing important and rapid changes in our social structure. He will concede that some of these have affected medicine and that he is concerned about the quality of medical care and the doctor-patient relationship. He has grave misgivings about the way the delivery of medical care is being financed and the increasing role of the federal government in managing his own affairs.

His memories of the past are nostalgic, and he underestimates the speed at which the future is breaking on our shores. Most doctors would just like to be left alone and given time to take care of their own patients, to keep up with the literature, and perhaps to do some teaching and research. Their life is so busy, useful and rewarding that even the demands of family life are hard to meet, much less the social and economic problems that beset the profession on every side.

Thus it is that with our society going through a youth revolution, a sexual revolution, a racial revolution, a colonial revolution, an economic revolution, and the most rapid and deep-going technological revolution in our history, some of us "do not feel at home." It becomes increasingly easy to narrow our field of concern to gain momentary reassurance, only to be rudely awakened by the sudden thrust of the new society that is cresting upon us.

Some thirty years ago Blue Shield plans began to emerge throughout the country as a means of financing medical care for the indigent. Originally these were indemnity payments to the patient, and the plans did poorly until the AMA gave official encouragement to the principle of direct payment to the physician. Following this Blue Shield expanded rapidly. By the end of World War II the pattern of medical practice began to change. The value of Blue Shield had been accepted by the public, especially among the lower income groups. But as urban population began to expand and the cost of medical care began to go up, larger segments of the public began to feel the need for this form of coverage.

In the late 1950's the larger unions began negotiating agreements with management in which the entire cost of hospital and medical insurance for employees was covered. These unions began to fan out over the United States, across state borders, creating a demand for uniform benefits at a predictable cost. Blue Shield and the medical profession met this challenge in many areas by offering service benefits to under-income families. The unions were articulate in spelling out their needs. Walter Reuther pointed this out when he stated: "Our goal has been to attain full service benefits in our Health Insurance Program."

As utilization and cost of medical care continued to climb, the public began to feel the need for more comprehensive coverage, and the medical profession through Blue Shield

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Dr. Dunlop is Chairman of the Board of Directors, Massachusetts Blue Shield; Vice Chairman of the Board of the National Association of Blue Shield Plans; Senior Surgeon, Memorial Hospital, Worcester, Massachusetts; Regent of American College of Surgeons.

This paper was originally presented at the 181st Annual Meeting, Medical Society of Delaware, October 17, 1970.

made this available in many areas of the United States. However, the coverage was spotty and the benefits far from uniform. In some states, the medical leadership was not able to convince the physicians that full-fee programs should be promoted and that indemnity payments were largely an expression of non-commitment on the part of the profession. Physicians in these areas believed that they would continue to have a voice in their own affairs even if they operated outside the area of public need. They did not believe what the Doctors Sommers of Princeton recently said: "Freedom to avoid the basic facts of change does not exist."

Full Service Programs

What has actually happened to these full-service programs? Where the programs offered to the public were adequate, the plans prospered, the public was pleased, and the image of both the medical profession and Blue Shield was enhanced. Furthermore, the tax-free status of the plan seemed justified, and no one could append the label of just another insurance company.

I don't mean to imply that physicians in those areas where only indemnity payments were offered were not necessarily doing a statesman-like job or weren't sensitive to the public need. As individuals, many were accepting unrealistic indemnity payments as payment in full. This was their contribution to the public need. However, these well-meaning physicians didn't seem to realize that a large percentage of the patients they were serving weren't themselves paying for their Blue Shield premiums. And it was the big buyers — government, automobile, and rubber — that were paying the premiums. Although an intent to act responsibly may have characterized the doctors in these parts of the country, these good intentions could not be transferred to a contract, and therefore in the eyes of the big buyers they didn't exist.

It is well to pause here and examine the unusual relationship that exists between Blue Shield and the medical profession. Representing the best interests of the public and of the providers of medical care, Blue Shield speaks with an unbiased voice in its dealings with management, labor and government. Charges of conflicting interest are not easily raised against this association with its dual public responsibility. On the other hand, the medical profession has through its relationship with Blue Shield an effective voice in its own affairs.

Historically the Blue Shield plans, together with the medical professions, have done a creditable job in meeting the needs of the community, but as large national groups were formed, such as those composed of the federal employees, the united automobile workers and the steel workers, national needs became increasingly important and in many areas outstripped the priority of local needs. Because of the spotty performance of the Blue plans in being able to offer and guarantee comprehensive benefits at a predictable cost, the "Usual, Customary, and Reasonable Fee" program was developed with the hope that through such a mechanism the employee might be given the medical care he needed and that the large purchasers of medical care would have less trouble in budgeting their costs.

Not Available

In spite of these efforts, paid-in-full programs for federal employees are unavailable in Connecticut, Washington, D. C., Nevada, Buffalo, New York, Jamestown, New York and Rochester, New York. In other parts of the country some physicians continue to send supplementary charges even though their bills are being paid according to their own charging profiles and those of their colleagues in the same area. Labor, industry, and government have reacted to this experience with some resentment, since most of these large groups had increased their premiums one third or more to allow for the higher payment to physicians resulting from the "Usual, Customary, and Reasonable Fee" program. One corporation increased its premium costs $15 million a month with the hope that it could offer its employees paid-in-full programs at a predictable cost.

With so much money involved it is understandable that the large purchasers of medical services not only require costs that could be budgeted in advance but some controls which can protect them against unwarranted escalations in cost. Some unions began to feel that the "Usual, Customary, and Reasonable Fee" program would soon collapse in the face of rising costs and a lack of control.

Government and management began to seek other intermediaries and to experiment with other methods of delivering health services. HEW has made available federally insured mortgages to build and equip facilities for closed panel practice. Philip R. Lee recently said, "We in Washington are frankly in a crusade to encourage the expansion of group practice."

In New Haven, Connecticut, the Yale Medical School is attempting to build up a program financed by the AFL-CIO under the leadership of Isador Faulk. In Providence, Rhode Island, Brown University is working out a relationship with the unions whereby medical services will be offered through satellite hospitals on a prepaid basis. In Boston, Jerome Pollack was the architect for the Harvard Community Health Plan, which encompasses the construction of a health center served by members of the staff of the Peter Bent Brigham and Beth Israel Hospitals. Johns Hopkins Medical School is setting up a similar program in the new town of Columbia, Maryland, financed by the Connecticut General Life Insurance Company.

These are some examples of what has been happening where the big buyers of medical service cannot find what they want on the Blue Shield shelf.

The tide of events has permanently interjected a third party between the physician and the patient because the patient can no longer finance medical services himself. Most of us are medically indigent when faced with a serious illness. Today the network of social ties is so tightly woven that the consequences of contemporary events radiate instantly around the world. Many doctors do not seem to realize that these large purchasers of medical care have written the cost of medical services into almost every product we buy today and that doctors in hospitals are woven into the very fabric of our economy. When a hospital Board of Trustees increases the daily cost of a bed, or a committee of the state medical society increases the medical fee schedule, the cost of manufacturing an automobile may go up.

What the Public Wants

I think it can be unequivocally stated that the public wants paid-in-full programs at a predictable cost with effective control. The purchasers of medical services today will buy these from the Blue Shield medical team if they are available. If not, the government, medical schools, or the unions themselves, will set up their own programs and some have already done so. The AMA is not in a position to solve these problems of financing medical care because in the eyes of the public any association made up of physicians alone is faced with a conflict of interest when dealing in money matters.

Blue Shield on the one hand must sell its contracts in the open market offering a product that is not only reasonable but attractive to the public buyer. On the other hand, Blue Shield has the responsibility of representing the physicians, or of the providers of medical care, and seeing that their interests are equally well represented.

Having attended meetings dealing with the problems of financing medical care for the past 18 years, it is my impression that the public has a high regard for the inhospital medical care which is given the average patient. They have a high respect for their own physician and for the motivations of the profession as well, particularly when it comes to medical treatment. They believe that the delivery of ambulatory services needs to be improved and that in the field of medical economics the profession has apparently lacked the necessary leadership as we move into the age of a superindustrialized society.

The profession in turn has many new needs in this same medical economic arena. There is a need for a multi-million dollar, highly sophisticated electronic data processing system with compatible systems throughout the United States. The profession needs up-to-date information systems which will keep it informed of the utilization and cost of medical services, trends in physicians' charges, the availability of medical care, planning and programming at a national level to keep the financing system up-to-date with current national needs. Even under the aegis of the AMA small groups of physicians are unable to do this. Without the back-up of Blue Shield's years of experience in the prepayment field, without professional staffing in underwriting, accounting, public and professional relations, and the technological back-up for utilization review, the profession is in a vulnerable position.

Equally important is the fact that Blue Shield could never exist without the support, guidance and counsel of the medical profession. The whole concept of the Blue Shield system resulted from the planning and imagination of groups of physicians throughout the country. The partnership is vital to the survival of both.

In the past, physicians adapting to comparatively stable environments maintained longer lasting ties with their own conception of "the way things are." Today we move in a highly transient society, are forced to truncate our relationships with the public, and must turn over our conceptions of reality at shorter and shorter intervals. These rapid changes in our society are straining our capacities to adapt. Harold D. Lasswell of Yale stated, "All the researchers on learning seem to confirm the view that energies are bound in support of past learning and that new energies are essential to unbind the old."

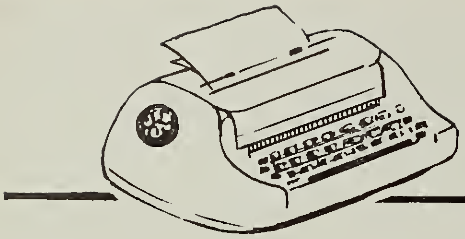
No matter what our personal view may be, and as one who strongly supports the private enterprise system and deplores the encroachment of further bureaucratic control, I am convinced that the public needs comprehensive medical services with proper controls and at a predictable cost. I believe that the public prefers to obtain and finance these in the private sector but will look elsewhere if its needs cannot be met. I firmly believe that the medical profession needs the back-up offered by a partnership with Blue Shield in order to define, administer, and finance these needs. I believe that the revolution is here and that together we must face it head on. In medical judgments doctors have been schooled for generations, but in medical economic judgments their background has been limited by preoccupation with the sick. Blue Shield with its ear to the ground can tell what the public is saying, and we need to heed that voice.

THE UNIVERSITY AND THE CITY

While mindful of the gains of certain disciplines in finding ways of applying their skills to policy questions (the work of economists dealing with national income), we must still conclude that many of the chief problems confronting our society are not ones that will yield readily, if at all, to the kinds of knowledge university intellectuals can produce. . . . The limits to university expertise with respect to social issues arise from the very nature of the university and the advancement of learning, and are not generally the result of either disinterest or stupidity.

If students of medicine, law, education, city planning, public health, business, and other professions can only be taught by giving them part of the city on which to practice, it is appropriate to ask what they intend to give back to the city in return. If the values these students are taught to cherish — values of compassion, equality, dignity and intellectual integrity — are systematically violated in parts of the society wherein they will make their living, it is only right that they be made to feel slightly uncomfortable about the prospect of seeking that living in ways that permit these problems to be neglected.

Abstracted from The University and the City, Harvard Today Publications. 1969.



Special Reports

HIGHER EDUCATION AND THE NATION'S HEALTH

Policies for Medical and Dental Education

The 1910 Flexner report of the Carnegie Foundation has done much to shape the pattern of American medical education for the past 60 years. Now a new Carnegie Commission on Higher Education urges an overhaul of medical training — a task which under the plan would run at least $1 billion.

The report recommended increasing the number of medical students by 50 percent over the next decade, while shortening from eight to six years the overall length of medical training. A comprehensive system of 126 health education centers would be established throughout the country. It would serve more Americans, and, through medical school affiliation, would relate medical training more effectively to the delivery of health care.

Dr. Clark Kerr, former president of the University of California, headed the 19-member commission. It recommended development of nine new American medical schools and establishment of a National Health Manpower Commission to review health care personnel and a voluntary organization to provide better service to low income and rural areas.

In the financial arena, the report urges federal monetary support of medical education of up to $1 billion by 1980, a more equitable financial distribution between federal and state governments for support of medical care, and grants from states to private medical schools to support these changes. The commission also recommended grants of $4,000 per student to institutions training health professionals, and a standardized tuition in the range of $1,000 yearly for all medical and dental schools.

Next year the Commission will issue its final report, but because of the many problems, the Commission sees a need now to present a brief report, "Higher Education and the Nation's Health: Policies for Medical and Dental Education."*

The major theme is that in order to improve health care we must have more and better health manpower, more and better health care facilities, better financing arrangements for the health care of the population, and better planning for health manpower and health care delivery.

The greatest priorities for higher education in the 1970's are the provision of greater equality of educational opportunity for all our youth, reform and innovation in medical education, and the production of more health care personnel. All three of these priorities are discussed.

Two health care models are presented: the health care delivery model, (the medical school, in addition to training, does research in health care delivery, advises local hospitals and health authorities, works with community colleges and comprehensive colleges on the training of allied health personnel, carries on and generally orients itself to external service); and the integrated science model (all or almost all of the basic science and social science instruction is carried on within the main campus and not duplicated in the medical school, which provides mainly clinical instruction). To this end, 27 health science centers are now being started around the

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* The complete report may be obtained from the McGraw-Hill Book Company, Hightstown, New Jersey 08520 for $2.95 each.

United States and seven more are being considered. A need is seen for nine more, of which one will be in the standard metropolitan statistical area of Salem County, New Castle County, and Cecil County with the recommendation that it be in the Wilmington area.

One of the most important reforms suggested is shortening the time it takes to become a practicing medical doctor from eight years after the B.A. to six years. They also would like to improve the residency by giving the young doctor a wider variety of experience and more of it under skilled supervision.

To cut the costs of an expanded health manpower program, the report recommends decreasing from four to three years the time for an M.D. degree, decreasing from four to three years the time it takes to fulfill residency requirements, starting two classes a year in medical schools, teaching during the summer period, and increasing the minimum size of a medical class to 100. Throughout the report there is a great deal of stress on the training of physicians' and dentists' associates and assistants.

The expansion of federal expenditures for biomedical research following World War II brought about university medical centers which became loci of sophisticated diagnosis and treatment, and extended their influence to the practitioners of the surrounding communities resulting in a general increase in the quality of care in the areas. "But the center's effect on the quality of care in their communities is far less significant than it could be if an effective health care delivery system became a primary element of medical center concern."

The section devoted to *The Future of Health Care Delivery* is predicated on the fact that future medical and dental education must be geared to impending changes in patterns of health care delivery. Although there is much disagreement about the precise nature of the changes that are likely to occur, there is agreement that change is inevitable and imperative. There will be a spread of prepaid group practice, greater emphasis on achieving effective functioning of true health care teams, a shift to greater emphasis on care outside the hospital, and a shift towards considering health care a public utility. The rate of acquisition of new knowledge and technology in the biomedical sciences will continue to be very impressive, and the most important impact on the health care system will come from more extensive use of computers and automation techniques which will bring about information networks to make possible the transmission of medical records for analysis and consultation without regard to geographic location. The education, service, and research functions of medical and dental schools will become more effectively oriented to the shift from a nonsystem to a system of health care delivery.

The Future of Health Manpower Education, states that the number of medical school entrants or their equivalents should be increased from the 10,800 estimated for 1970-71 to about 15,300 by 1976, and 16,400 by 1978. The desired increase of 5,600 new places (52%) by 1978 can be achieved by having all existing medical schools shift to a three-year program and adding new places by physical expansion and by the establishment of nine new schools to provide 900 to 1,350 new places. One of these recommended new schools would be in the Wilmington, New Castle County area.

The Commission also recommends that all university health science centers consider the development of programs for the training of physicians' and dentists' associates and assistants, forthwith. In developing plans for expansion, university health science centers should adopt programs designed to recruit more women and members of minority groups as students.

In addition, the Commission recommends the conversion of schools of osteopathy to schools of medicine, wherever feasible.

The Commission recommends that university health science centers be responsible for coordinating the education of health care personnel and for cooperation with other community agencies in improving the organization of health care delivery. Their educational and research programs should become more concerned with problems of health care delivery and social and economic environment of health care. All new medical and dental schools should be parts of university health science centers, and, wherever feasible, existing separate medical and dental schools should likewise become parts of university health science centers.

The Commission recommends that all universities with health science centers, and especially those developing new centers, consider plans for greater integration of preprofessional and professional curricula, so that basic training in health-related sciences can be followed by training for a variety of health-related professions as well as medicine and dentistry.

Existing two-year medical schools should be converted to provide full M.D.-candidate education as soon as possible and no new two-year schools be established.

Public Health Schools should be made parts of university health science centers.

The Commission also recommended that all university health science centers give serious consideration to curriculum reforms, make their admission policies more flexible and their programs more responsive to the expressed needs of students; greater emphasis should be placed on comprehensive medicine in both the M.D.-candidate program and in graduate medical education, and residency training should include experience in community hospitals, neighborhood clinics, and other facilities, as well as in teaching hospitals.

The Commission also realizes the distances between university health science centers are likely to be very great in the sparsely populated states while the concentration of people in congested urban areas may overwhelm the facilities of even the largest health science centers. In these types of areas there should be "area health education centers," to provide facilities for patient care, often on a referral basis from surrounding areas, and educational programs for house officers and, to some extent, for M.D. candidates who could rotate through an area health education center from a university health science center. Clinical experience for allied health students and continuing education programs for all health manpower could also be held in this type of area health education center.

The Commission recommends 126 "area health education centers" be developed.

The Commission also recommends the development of a voluntary national health service corps. As an incentive for participation in the corps, an M.D. or D.D.S. would be excused from loan repayment during periods of service, and 25% of the maximum indebtedness he is eligible to incur would be forgiven.

On the subject of 'Tuition Policy' the Commission recommends a relatively low uniform national tuition policy for institutions providing medical and dental education.

The Commission believes also that a vigorous biomedical research program is essential for continued progress in combating disease and that it is an integral component of the process of medical and dental education. And to that end they recommended that federal financial support of research in university health science centers be maintained at its present percentage of the gross national product. Funds should also be made available to support research on methods of achieving greater efficiency in health manpower education and in the delivery of health care as well as for biomedical research. Federal allocations should cover the total cost of research projects, and not less than 10% nor more than 25% of the research grants to any university health science center should take the form of institutional grants rather than grants for specific research projects.

On the subject of recertification, the Commission recommended national requirements for periodic reexamination and recertification of all physicians and dentists by specialty boards and other appropriate bodies.

The Commission suggests a National Health Manpower Commission to study changing patterns of education and utilization of health manpower, with particular reference to new types of allied health workers, to changing patterns of health care delivery, and to the feasibility of national licensing.

As to the role of the states in the manpower program, the Commission recommends that states should continue to provide substantial financial support for medical and dental education and states that have lagged in the past should plan for significant increases in expenditures for this purpose. In addition, the states should provide major financial support for house officer training and the education of allied health personnel.

Regarding community colleges, the Commission recommends that they develop and expand their curricula in allied health professions and also seek guidance from area health education centers in the planning and evaluation of their educational programs.

The Commission recommends that private foundations that have traditionally provided support for health manpower education and research should continue to do so and that foundations that have not provided such support in the past should consider expanding their programs to include it, as well as support for research on the delivery of health care.

All of the foregoing are included in the ten goals the Commission recommends be achieved by 1980. (1) Expansion of the functions of university health science centers so that they can play a central role in coordinating and guiding health manpower education and cooperating with other agencies in the development of improved health care delivery systems in their regions, (2) development and expansion of programs for physicians' and dentists' associates and assistants, (3) acceleration of medical and dental education, thereby achieving greater efficiency, (4) integration of the curriculum, including such changes as consolidation of instruction in the basic sciences on main university campuses, integration of preprofessional and professional education, and more carefully integrated and coordinated programs of postgraduate training, (5) changes in medical and dental education so that they are more responsive to the expressed needs of students and more concerned with problems of delivery of health care, (6) a 50% increase in medical school entrants, (7) initiation of nine new university health science centers, among them New Castle County being expressly mentioned, (8) positive policies to encourage the admission of women and members of minority groups to professional training in medicine and dentistry, (9) a 20% increase in dental school entrants, (10) development of approximately 126 area health education centers, affiliated with university health science centers.

In conclusion, I would urge all members of the medical and dental professions to secure a complete copy of Higher Education and the Nation's Health: Policies for Medical and Dental Education. It is a report that should be in the library of all professional people.

*Clifford Foster

PRESIDENT NIXON REQUESTS ASSISTANCE OF MEDICAL PROFESSION IN DEVELOPING HEALTH CARE PROGRAMS

Annual Meeting of the American College of Cardiology, Washington, D.C., February 4, 1971.

President Nixon, in addressing the 20th Annual Meeting of the American College of Cardiology stated that throughout this year *decisions will be made that will affect our lives,* and will affect the lives and the health of all of the American people in the development of health care programs. He stated there is disagreement as to what is the best approach, but all agree that we should find better methods to see that all individuals who need medical care can have an opportunity to obtain it.

He said, "In order to achieve that objective, we need *assistance.* And that is why I say to my friends in the medical profession that I know how you are concerned, and you should be concerned, about what is the government going to do to us now? How many more forms are we going to have to fill out? Is the government going to adopt a program in this country that we think has failed in other countries and, therefore, should not be applied on us?

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* Mr. Foster is Executive Director of the Health Planning Council, Wilmington, Delaware.

"And the answer is, there is no program for medical care in the United States or in any other nation of the world that will be good for the patient unless it is one that the doctors *support*, because we have to have the *cooperation* of the medical profession.

"So we want your advice, we want your cooperation, we want to work together with you in developing a program that will do what is needed to be done and do the best for our patients, your patients, but also what will *enable you to meet your responsibilities as unhampered as is possible* by Federal bureaucracy, red tape and the like."

President Nixon additionally paid tribute "to the dedicated people in the medical profession who are working in the most effective way they can at a time when the medical profession is under assault from various quarters due to the inability to spread medical care adequately, as some think it should be spread."

A note of caution was also expressed: "As we look, as we do now, at how we do a better job with regard to the *quantity* of medical care, let's not destroy the *quality* of medical care in the United States of America."

Herbert M. Baganz, M.D., F.A.C.C.

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Highlights

CONVERSION HYSTERIA — A MEDICAL EMERGENCY

Harold Stevens, Ph.D., M.D., *Professor of Neurology, George Washington University Hospital, Washington, D.C., Neurologist to Group Health Clinic; Presented to the Section of Neurology, Department of Medicine, WMC, September 1969.*

It may seem presumptuous for a neurologist to arrogate a psychiatric syndrome, particularly hysteria, since, according to Fenichel, conversion hysteria is the classic subject matter of psychoanalysis, and the psychoanalytic method was discovered and perfected through the study of hysteria. It is a curious paradox, however, that conversion hysteria, the study of which provided the foundation of psychoanalysis, is now regarded as practically nonexistent by most of the modern successors to the Vienna psychoanalytic school.

Actually, conversion hysteria is common; it occurs at all socio-economic stations and at all levels of education. I have found it in six nurses, two of whom were victims of epidemic hysteria, and in one physician. The latter suffered monoplegia following a "whiplash" injury. It recurred with a second "whiplash" injury, litigation over which was resolved with out-of-court settlement. This case typifies the context in which hysteria characteristically occurs in the male — ie, in connection with litigation in an urban center, an increasingly common occurrence which controverts the claim that hysteria is decreasing in frequency.

The diagnosis of conversion hysteria is most reliably established by the history, the neurologic examination, and the successful demonstration by prompt use of amytal sodium hypnosis with suggestion that the syndrome is nonorganic and reversible. Through these three avenues the neurologist holds the key to differentiating conversion hysteria from the many organic syndromes which it may simulate. It should be stated in this regard that conversion hysteria in this paper means only a major manifestation of a motor or sensory defect; eg, hemiplegia, paraplegia, monoplegia, tremor, incoordination, anesthesia of limbs and body, blindness, deafness or epileptiform seizures.

History

The history often reveals a woman with a story of many illnesses in the past, frequent physical examinations and often many operations, and vague multiple complaints in addition to the hysterical manifestations. There is often an immediate precipitating event, a history of past conversion reactions, possible identification with someone who has or had similar symptoms (organic or functional). Often the patient demonstrates surprising indifference to her disability but is depressed as was true of 40% of hysterical patients reported by Ziegler and associates.

Neurologic Examination

Examination usually shows absence of objective signs to correspond with the hysterical complaints, a nonanatomic pattern of paralysis, anesthesia, or other disorder, and a high degree of suggestibility. The so-called stigmata, such as corneal anesthesia and loss of gag reflexes, I have found only infrequently and therefore of little value.

Amytal Sodium Hypnosis

The most conclusive proof of conversion hysteria is the successful removal of the defect with amytal sodium hypnosis. This is convincing to the consultant, to the patient, and to the referring doctor.

In applying this combined diagnostic and therapeutic measure, the neurologist may be criticized for exceeding the limits of his competency and usurping the field of the psychiatrist. Further, it has been contended that patients may become overtly psychotic when the symptoms are removed with hypnotic suggestion. I have never observed such a sequence in any of more than 300 amytal sodium interviews.

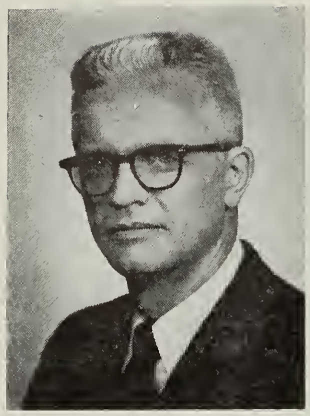
Although conversion hysteria is psychologically determined, and although the pathogenesis has not yet been established, the physician has a compelling obligation to his patient to treat the disability correctly and, what is most important, promptly, before the symptoms become irrevocably congealed and before the patient is possibly subjected to unnecessary surgical treatment. In this sense, the treatment of conversion hysteria is an emergency.

It is evident that the diagnostician must be knowledgeable, uncommitted, patient, and objective. He must not judge or prejudge, nor should he imply by verbal or nonverbal communication that he suspects malingering or hysteria. He must be conversant with a long list of techniques in determining whether a manifestation is functional or organic. Most important, he must not be misled into a functional explanation because the patient's manifestations are bizarre. Even the most unsophisticated neurologist soon learns that neurologic syndromes are frequently bizarre and that this is no hallmark or pathognomonic stigma of functional disease. Further, conversion hysteria may also complicate an actual organic disease or cause secondary neurovascular and other disuse phenomena.

Needless to say, the physician's therapeutic orientation must be tailored to the patient, not to the syndrome. Extreme caution is essential in employing any form of depth or intensive therapy, but the physician is compelled to extend his initial diagnostic and therapeutic endeavors since as a result of the dramatic resolution of the patient's disabling symptoms at his hands he may find himself in better rapport with the patient than any other specialist could be. It is incumbent upon him to utilize this opportunity, particularly since, in my experience, the patient with hysteria often declines formal psychotherapy or will not cooperate in such a program.

The neurologist or any other physician must provide sympathetic emotional support in a few personal interviews. Some psychotherapists would regard this formula as superficial. But often, especially in conversion hysteria, it is more realistic to settle for limited therapeutic objectives.

The precise meaning and mechanism of hysteria remain unknown. It is more constructive and realistic to acknowledge our ignorance and adopt a philosophy of objective scientific agnosticism than to fill the void with picturesque speculations which by their very nature call for prolonged and questionable therapy and thus prevent the prompt and effective treatment required.



President's Page

BRIGHTER HORIZONS FOR MENTAL HEALTH DELIVERY IN DELAWARE

It may have started only among a few citizens of Kent County, but a chain reaction is on its way in our state. Economy is an important word in any organization. In this instance economy started this chain reaction when economy closed the night clinic doors of the Kent County Mental Hygiene Department.

The first link in the chain reaction was a small committee formed in September 1970 and headed by Mr. Ray Stone. This committee felt the clinic could work more efficiently if a larger space were acquired, thus making up the loss of night clinic hours. To date, this group has had limited but encouraging success.

Members of the original Planning Committee for Mental Health Care offered to band together with Mr. Stone's committee, in an effort to rekindle the forces that once spoke out for mental health care planning in Kent County . . . this was the second link in the chain.

This coalition of groups met on March 10, 1971 in an organizational meeting. It was pointed out that the needs are not being met in many categories and that this economy is not economy, but a road block in the mental health delivery care system.

From the office of every physician in this state can be listed the many areas where mental health care is not being delivered; from the courts, the schools, the social services departments, and the police, the story is the same as from our offices — not enough mental health care delivery.

Recently a sign of relief was flashed in the newspapers of our state. We are making reference to the pact signed with the Jefferson Medical School to establish jointly at our State Hospital a teaching department of psychiatry. Upon the activation of this program and hopefully the future integration with the University of Delaware and Wilmington Medical Center through the Delaware Institute of Medical Education and Research, we will have welded together a force so dynamic that it should be able to give aid and psychiatric support to all of our clinics. We will then be able to point to our state as a complete state in the mental health comprehensive care field.

Meanwhile we wish the people in the grass roots of Kent County success in pressing for all the improvements and advantages they can obtain. We only hope we can be of service to them in their venture.

Rhoslyn J Bishoff

Editorials

PREVENTIVE MEDICINE: AN END TO LIP SERVICE

It is my belief that all plans and proposals currently being proposed to solve the health care crisis are doomed to fail.

The heart of the matter is that our society is generating more health care needs than any system can successfully manage. Despite the now-fashionable lip service given to "preventive care." there is virtually no proposal which really addresses itself to this indispensable but sadly neglected aspect of health care. This is true of all the bills competing for primacy in the Congress, including that of the American Medical Association. No revision of methods of financing, no fine-tuning or restructuring of administrative bureaucracies, no building program of health science centers (126 or 1260) will do much to really solve the problem.

- Our high maternal mortality results from poverty and ignorance. (Forty-five percent of women admitted to *public* hospitals in labor have never had a prenatal examination.) Our high infant mortality results from poverty-stricken and ignorant mothers taking their newborn babies back to the squalor, filth and malnutrition of their rural and urban slums.

Preventive medicine requires a direct attack on poverty and ignorance to significantly improve maternal and infant mortality.

- The automobile slaughters more than 55,000 per year and maims and seriously injures one-half million. Special trauma teams and facilities in emergency rooms, helicopter transport and helipads at hospitals are very valuable in saving lives but do not represent *preventive* medicine.

Preventive medicine means stopping the slaughter from occurring by restriction of the indiscriminate use of the privately operated automobile, by effective control of the alcoholic driver, etc., etc.

- Twenty thousand gun deaths and 200,000 serious gunshot injuries occur yearly in the United States. The victims are fascinating problems and clinical challenges, but multiphasic screening and prepaid medical care will not change the demand that this peculiarly American aspect of our society places on the health care system.

Effective gun-control laws at federal and state levels would, in effect, be major preventive medical action, much cheaper in dollars and infinitely cheaper in lives.

- Very recently another burden has been placed on the health care system, abortion. The vast majority of unwanted pregnancies result from ignorance or carelessness, not from the failure of contraceptive measures. It is folly to make abortion readily available without a concomitant educational drive to disseminate contraceptive information. Not to get pregnant is cheaper and healthier than to have an abortion.

- The spiraling increase of respiratory affictions is directly attributable to environmental pollution. Respiratory therapy and pulmonary function laboratories are vitally needed, but are therapeutic "after the fact." Aggressive anti-pollution and environmental restoration legislation would be dynamic preventive medicine.

In this vein, government purchase of huge tracts of seashore, wetlands and wilderness areas located hundreds or thousands of miles from the major concentrations of population is desirable. As a card-carrying member of the Wilderness Society, the National Parks Association, etc., I support this. However, because of time and affluence requirements, these areas may be used by a minority of our citizens for a couple of weeks out of the year. It is much more important to restore the environment of our cities and suburbs where 90% of our population spend 90% of their time. Researchers might find this an exceedingly difficult area in which to conduct meaningful studies, but one must suspect that the ugliness and surliness of our cities contribute significantly to the unchecked death rate from cardiovascular disease.

Epoxy compounds in smog have already been identified as both carcinogenic and mutagenic. Preventive medicine calls out for their elimination.

No doubt more knowledgeable physicians and scientists could expand this list *ad infinitum.* In fact, one suggestion proposed here is a call for all to do so.

It is time that all medical societies, all hospital associations, all health insurance plans, all hospital boards of directors, all medical school educators, change tactics. We have no need to be defensive and apologetic. We have our Judases and our incompetents but they are a very small fraction of our profession.

It is time we stopped crawling to our lawmakers, state and federal, begging for minimal funds with which to do an all but impossible task.

It is time we demanded that they do their job so that we can do ours.

It is time the American society eliminated truly preventable disease.

Harold S. Rafal, M.D.

LAST ENTRY: J. R. DURHAM'S MEMO BOOK

"November 18, 1970: It has always been our family custom to mark each holiday, anniversary, or event with music, and very often we invited our friends to participate in song, and skit, and laughter.

"And so it would please me that my family and my friends meet together one more time — one last time, remembering me not in sorrow, but in pleasantness. I want to express: My thankfulness for the privilege of my life in which the blessings far outweighed any privations, and in which I hope what I did that was good over-balanced any evil; my gratitude for the joy of my work, the thrill of flight, and the sound of music; for the love of my family and my friends without whom the last six months would have been bleak indeed.

"I want to thank my colleagues who have so tenderly cared for me, ever forbearing my crotchets. How well they have learned from me the truth of that old saw that doctors make rotten patients. And I want to thank those colleagues, too, who took over the burden of my work whenever I was too ill to work. Ask the band to play . . ."

This was read at Dick's memorial service along with several favorite quotes: Blake, Hans Zinnser, William Osler, Antoine St. Exupery. His widow has given us her permission to share it with you.

A NEW PENICILLIN

Hetacillin,* a new semi-synthetic penicillin is a derivative of 6-amino penicillanic acid, containing the 6-amino group as part of an imidazolidine ring. Hetacillin is prepared by the reaction of acetone with ampicillin. *In vitro* it has essentially the same antimicrobial spectrum and potency as ampicillin.

Early pharmacologic studies[1,2] suggested that hetacillin achieves higher blood levels and urine levels than the parent antibiotic, although this advantage has been disputed in some of the later literature.[3,4] It appears that this slight difference in serum and urine activity provides the only justification for the introduction of this new antibiotic. Hetacillin rapidly hydrolyzes to ampicillin *in vitro* and *in vivo*, and the active antimicrobial agent in the blood and urine of patients taking hetacillin is in fact ampicillin. Hetacillin has had numerous clinical trials in adult and pediatric patients with a variety of infections. This antibiotic appears to be particularly effective in the treatment of patients with bacterial respiratory and urinary tract infections. It has had more limited clinical trials[5,6] in infections of the gastrointestinal tract due to salmonella and in bacterial meningitis and endocarditis. In all of this experience hetacillin appears to be as effective as the parent antibiotic.

The results of hetacillin therapy in 105 patients in the Wilmington Medical Center were reported[6] in the literature in 1968. The auth-

Continued on next page)

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* Versapen® (Bristol Laboratories)

Delaware Academy of General Practice

THE DEMISE OF THE DAGP

At its last annual meeting, which was held in San Francisco last September, the AAGP voted in favor of changing its name to the American Academy of Family Physicians. When the by-laws are amended in September of this year, the change will become official. Naturally all its constituent chapters will change names also, and the DAGP will become the DAFP.

During preliminary discussions and debate over the past several years, there were many who opposed this change and what they regarded as a Madison Avenue sort of gimmick to upgrade an image which they felt didn't need upgrading, and of which they were proud. After all, they said, they had served their patients long and well as GP's, and GP's they'd remain. They felt that General Practice has a long and honorable tradition, and to give up the name now, no matter that it is antique, or has indeed become almost pejorative, is a form of self-betrayal, and although they didn't use the term, surely a "cop-out."

Many adherents, on the other hand, would frankly admit feeling the name change necessary indeed as a part of improving the GP's tattered image. They feel that if the family doctor of today is going to be a better doctor than he used to be, better trained, more sophisticated, with broader interests and wider horizons, and yes, even board-certified, then he needs a new name and his organization does too.

Well, the name change is now almost a *fait accompli*, and the grumblings and the protests of the opposition will fade away. Now what we need is to see a whole lot of these "new breed" family physicians, and there's a fair chance we're going to get them. The list of approved residencies in Family Practice keeps growing, and so does the stack of applications for them.

One of the newest on the list will shortly be at the Wilmington Medical Center which, it is expected, will accept its first residents on July 1st of this year.

DAFP physician members have worked hard to make this residency program a reality. They hope everyone in our community will see it as a good thing and will give it the support it needs and deserves, both in principle and in fact.

Dene T. Walters, M.D.

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EDITORIALS

(*Continued from page 80*)

ors concluded that hetacillin was well tolerated and gave satisfactory results in a wide variety of infections. However, they could not recognize any advantage over the parent drug and felt that it would be necessary to carry out extensive, well-controlled, double blind studies in order to demonstrate any significant advantage of this new formulation. Until evidence of the superiority of hetacillin is presented, it would not seem reasonable to recommend this new antibiotic in preference to the previously available ampicillin preparations. The clinicians should be reminded that hetacillin, like its parent drug ampicillin, is susceptible to the effect of the penicillinases and therefore, is not effective against penicillinase-producing strains of staphylococci.

W. J. H.

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5. Scioli C and Giusti G: Hetacillin in the treatment of typhoid fever. Clinical Medicine 74:68-70, 1967.
6. Hogan LB, Holloway WJ and Scott EG: Clinical experience with hetacillin. Current Therapeutic Research 10:363-372, 1968.

Letters to the Editor

To the Editor:

Several years ago, Dr. Chestnut of Student Health at Hopkins indicated that college health services were making too much of the problem in the usual case of mononucleosis. Dr. Herbert L. Walter and I have the impression that some of our colleagues as personal physicians are apt to hold students away from their classes longer than we ourselves would do if the student were being treated on campus. We believe that the usual student can battle his way through mononucleosis, even a severe case, without having to withdraw for the remainder of the semester for health reasons.

It is also our experience that students with marked tonsillar and pharyngeal involvement are made more comfortable when treated with steroids. Dr. Willard Dalrymple at Princeton has been advocating this for over five years.

Although infectious mononucleosis is sometimes called "the kissing disease," observations on our campus indicate that "pin mates" and married couples rarely both have mononucleosis, and we have only twice seen the illness in roommates. Our impression is that the hepatitis associated with mononucleosis is noncontagious and carries a benign prognosis.

Gordon Keppel, M.D.
Director of Student Health
University of Delaware

To the Editor:

In mid-1969, the Office of Emergency Health Services of the Delaware State Board of Health (Division of Physical Health) assumed responsibility for the Packaged Disaster Hospitals stored in the State. It was decided that the first step in this new responsibility should be to review realistically the positioning of these hospitals in relationship to the potential for disaster.

The most common disasters encountered are natural disasters such as storms and fires, to which the Delaware coast line is extremely vulnerable. Surprisingly enough, it became evident that the existing positioning of the seven Packaged Disaster Hospitals (PDH) afforded no protection at all to the coastal areas since the nearest storage site was over twenty miles inland.

In October 1969, the Chief of the Office of Emergency Health Services met with representatives of Beebe Hospital and the Association of Delaware Hospitals at Lewes to discuss the problems of preparedness. From this meeting came an offer by Beebe Hospital of storage space for a PDH on the fifth floor of the institution's new wing. Construction plans had called for the area to be left unfinished; therefore this space was readily available. A tentative agreement for affiliation of the PDH with this hospital was made, thus making the supplies available for the hospital's use.

The people at Beebe Hospital don't look at disaster in the light that it can't happen to them. If you can remember the "March Storm" of 1962, which damaged our coast extensively, you will appreciate that we were just lucky not to have had many more casualties.

All hospitals know how to handle the patient load with the hospital operating at normal capacity; they can also estimate the number of emergency patients they can manage. But do all hospitals know how they would handle more patients than they had ever seen before at one time?

In past years, Beebe Hospital has conducted an annual disaster drill unlike those in some areas where a walk-through drill is conducted. It is just like the real thing. For example, this year they had twenty patients delivered to them by ambulances from Sussex County fire companies, following a simulated disaster in Rehoboth.

(*Continued on page 84*)

Deaths

DR. J. RICHARD DURHAM

Dr. J. Richard Durham died at his home on December 30, 1970, at age 62. He had had a brain tumor for some time, but had continued his practice until some weeks before his death. Dr. Durham had been in practice in Wilmington since 1937.

Dr. Durham was a native of St. Louis, Missouri, but was raised in Warren, Pennsylvania. He attended Haverford College for undergraduate work and graduated from Jefferson Medical College in Philadelphia. He interned at the Wilmington General Hospital, then returned to Philadelphia for postgraduate work at Jefferson and Temple before entering practice as a cardiologist. Dr. Durham was certified in both Internal Medicine and Cardiology.

Flying was one of his big interests outside of medicine and Dr. Durham continued this interest. After serving in the Air Force in World War II, he became an examiner for the Federal Aviation Agency and served on its Medical Advisory Panel. He was a member of the Flying Physicians' Association and other organizations associated with flying.

Another major interest was in Dixieland jazz; he was a banjo and piano player, led a dance band when in college and formed The Dixie Doctors' jazz band in Wilmington. This band was a prominent feature of his funeral, expressing in true Dixieland tradition their initial sadness in blues, returning to joy when this saint finally went marching in.

Dr. Durham was a member of our local medical organizations, and was the head of the cardiology section at the Wilmington Medical Center. He was also a Fellow of the American College of Physicians and of the Council on Clinical Cardiology. He was the author of numerous scientific articles.

He is survived by his widow, Gloria Sieger Durham; two sons, J. Richard III and John C. II; a brother, Dr. Davis G. Durham of Wilmington; and a sister, Mrs. William W. Pinkerton, Jr., Stratford, Pennsylvania.

DR. JAMES M. CHASE

Dr. James M. Chase, of Dover, Delaware, died on January 15, 1971. He was a specialist in vascular surgery and had been in practice in Dover since 1964.

Dr. Chase was a native of Wilmington, Delaware. He took his undergraduate and medical work at the University of Maryland, receiving his M.D. in 1956. He served a year's surgical internship at the Delaware Division, then returned to the University of Maryland for his surgical residency. Following two years' service in the Air Force, he entered private practice in Dover.

Dr. Chase was a member of the local and state medical societies, and of the American College of Surgeons and was a Diplomate of the American Board of Surgery. He was president of the Kent County Heart Association. He was also active in a number of civic and social organizations.

His interests outside medicine were particularly in tennis, flying and skiing. Death occurred in the crash of a private plane returning from a ski trip.

Dr. Chase is survived by his widow, Retta; a son, Jeffrey M. and a daughter, Jill Melissa. He is also survived by his parents, Mr. and Mrs. James M. Chase, Sr., of Wilmington.

DR. SYLVESTER W. RENNIE

Dr. Sylvester W. Rennie, a past president of the Medical Society of Delaware and the New Castle County Medical Society, died on February 20 at age 69. Death occurred from a heart attack while he was vacationing in Puerto Rico.

Dr. Rennie was a native of Montreal, but had been a Wilmington resident for over 40 years. He graduated from high school here and received his B.S. degree in 1926 and M.D. in 1930 from the University of Pennsylvania. He served his internship and surgical residency in Abington (Pa.) Memorial Hospital and then took his residency in obstetrics and gynecology at Woman's Hospital, N.Y.C.

In his years of practice in Wilmington he had served as chief of obstetrics and gynecology at the Wilmington Medical Center, the Delaware State Hospital and the Governor Bacon Health Center. He was a member of the AMA, Delaware Academy of Medicine, Philadelphia Obstetric Society, a founding fellow of the American College of Obstetrics and Gynecology, and a fellow of the American Board of Obstetrics and Gynecology, the International College of Surgery and many other professional organizations. His social organization associations were also numerous. He was past president of the University Club, a member of the Rotary Club of Wilmington, the Yacht Club of Stone Harbor (N.J.), the University of Pennsylvania Varsity Club and a Trustee of Brandywine College.

During World War II, Dr. Rennie served as a Major in the Army and received official commendation for his work at Guadalcanal. He remained a member of the Association of Military Surgeons of the USA.

Despite all his activities he found time to travel a great deal and spent much time at his home in Stone Harbor. He was a connoisseur of good wine and good stories and was everybody's favorite raconteur.

He is survived by his widow, Mrs. Margaret Valentine Rennie, of Wilmington, and his stepmother, Mrs. Mary C. Rennie, of Arden.

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LETTERS TO THE EDITOR

(*Continued from page 82*)

To operate under these conditions it takes manpower, training, and equipment. In a small community hospital, a large stock pile of emergency supplies is something that is hard to attain. The PDH makes these supplies and equipment available to the hospital with no capital investment. The most popular and most realistic use of the PDH is to expand an existing hospital.

When the PDH is to be activated in or near its assigned hospital to permit the accommodation of more patients within the framework of that hospital's established systems, the PDH components will be utilized as specified in the hospital's disaster plan. This plan may call for using PDH cots and patient-care supplies to convert lobbies, sunrooms, halls, nurses' quarters, etc., into additional wards and for setting up the PDH equipment to expand the workload capability of the hospital's own laboratory, x-ray service, etc. The following predisaster preparations are necessary:

1. Specific provisions for the utilization of all components of the PDH should be included in the affiliated hospital's disaster plan.
2. A large enough disaster staff to care for the additional patients must be assigned.
3. Provisions must be made for orientation and training, both for the permanent hospital staff and supplemental disaster staff.
4. Arrangements, if not included in the current disaster plan, must be made for supporting goods and services such as water, fuel, food, laundry, communications, transportation, and traffic control.

The fact is that many PDH's have sat in storage areas and deteriorated. Through cooperation of all concerned, the one located at Beebe Hospital in Lewes, Delaware stands ready to save lives if need be during an emergency.

Kline G. Kemp, Jr.

Chief, Emergency Health Services
Department of Health & Social Services
State of Delaware

In Brief

In the News

Governor Russell W. Peterson recently made four appointments to the Authority on Radiation Protection. John W. Alden, M.D. of Woodbrook and Paul Smith of the DuPont Co.'s Haskell Laboratory at Newark were named to fill vacancies on the authority. Reappointed were Robert W. Frelick, M.D., director of the radioactive isotope laboratory of the Wilmington Medical Center, and Dr. Bruce C. Lutz, professor of electrical engineering at the University of Delaware. Their terms range from 1-3 years.

Recently elected officers for the county medical societies are: **New Castle County**, President, John J. Egan, M.D.; President-Elect, Harold S. Rafal, M.D.; Vice President, Henri F. Wendel, M.D.; Secretary, Marvin H. Dorph, M.D.; Treasurer, R. Walter Powell, M.D.; Trustees, Marjorie McKusick, M.D. and McHenry Peters, M.D.; **Kent County**, President, Winfried Mroz, M.D.; Vice President, Walter B. Omans, M.D.; Secretary-Treasurer, John Geissinger, M.D.; Trustees, Richardson Glidden, M.D. and Rafael Zaragoza, M.D.; **Sussex County**, President C. E. Graybeal, M.D.; Vice President, George Botte, M.D.; Secretary-Treasurer, David J. Reinhardt, III, M.D.; Trustee, John Howard, M.D.

Kidney Procurement

The Greater Delaware Valley Regional Kidney Program has organized a Regional Kidney Procurement Program to provide kidneys for transplantation to patients suffering from kidney disease and who live in and/or are being treated in the geographical region served (Eastern Pennsylvania, Southern New Jersey and Delaware). Information on the Program, which is a project funded by the Greater Delaware Valley Regional Medical Program, can be obtained or arrangements can be mde for kidney donation by calling 215-382-6888 at any time. Copies of a brochure explaining the program and the procedure for donating kidneys can be obtained by writing W. C. Ellenbogen, Program Manager, University City Science Institute, 3508 Market Street, Philadelphia, Pa., 19104.

AAGP Malpractice Policies

The Delaware Academy of General Practice has been notified by AAGP that the underwriter of the Academy-sponsored malpractice insurance program, St. Paul Fire & Marine, has served notice that AAGP policies which expire after April 1, 1971 will not be renewed. Affected physicians should immediately get in touch with the local agent writing their other insurance coverages and with their medical society in regard to securing replacement insurance.

Medical Aspects of Sports Seminar

The First Annual Seminar on the Medical Aspects of Sports was held on January 24, 1970, as part of the Continuing Education Program of the University of Delaware in cooperation with the Medical Society of Delaware. Copies of the proceedings of that meeting are now available for $2.25 each from: The Medical Society of Delaware, 1925 Lovering Avenue, Wilmington, Delaware, 19806.

Speakers on "Ask the Doctor"

Speakers for April 1971, on the Tuesday radio program (11:05 a.m. WDEL) produced by the Medical Society of Delaware are: April 6, Robert W. Frelick, M.D., *Is Early Cancer Detection Worthwhile?;* April 13, Peter R. Coggins, M.D., *Cosmetic Surgery;* April 20, Edward F. Gliwa, M.D., *Rubella Immunization Campaign;* April 27, I. Favel Chavin, M.D., *Reconstructive Surgery for Arthritis.*

MARCH CLINICAL NOTICES AND MEETINGS

Geriatrics Society Annual Meeting

The American Geriatrics Society, a scientific and educational organization of doctors and other professional persons interested in diseases of the aging, will hold its 28th annual meeting April 23-24 in Chicago, Ill. For information write: Edward Henderson, M.D., Executive Director, American Geriatrics Society, 10 Columbus Circle, New York, N. Y., 10019.

ACCP Continuing Education Program

The ACCP announces the course, *Interstitial Pneumonia — Acute and Chronic,* to be held in New York, April 22-24. Write to: American College of Chest Physicians, 112 East Chestnut Street, Chicago, Illinois, 60611.

Health PG Course in Diabetes

The Third Allied Health PG Course in Diabetes will be presented in San Francisco, April 19-21 by the American Diabetes Association in cooperation with the University of California. The course is offered to convey the most current knowledge and teaching techniques to members of the health team — directed in particular to nurses, nutritionists and dietitians. Fee for the course is $50 for members of the American Diabetes Association and $65 for nonmembers.

Temple Homecoming

The Annual Homecoming of the Temple University School of Medicine will be held on April 30 and May 1. On Saturday, May 1, complete physicals are available to all interested alumni and their spouses — $25 registration fee. The Temple Alumni Association is also sponsoring an out-of-country seminar and holiday trip to Ireland, Scotland and England, May 2-16, 1971. Contact the Alumni Office at Temple for further information.

Pennsylvania Heart Association

Exploring Surgical Treatment for Myocardial Infarction, the 21st Annual Scientific Session of the Pennsylvania Heart Association will be held May 6-7 at the Chatham Center, Pittsburgh, Pa. Write: Pennsylvania Heart Association, P.O. Box 2435, Harrisburg, Pa., 17105.

PG Trauma Course

Professor Gerhard Küntscher of Slensburg, Germany, will be the special guest of the Chicago Committee on Trauma, American College of Surgeons, for its Fifteenth Annual Postgraduate Course on Fractures and Other Trauma, May 5-8, John B. Murphy Auditorium, 50 E. Erie Street, Chicago. Write to James P. Ashtrom, Jr., M.D., Chairman, 55 E. Erie Street, Chicago, 60611, for further information.

ACP PG Course

The American College of Physicians will present *Intensive Care Units,* May 10-14, to be held at St. Vincent's Hospital and Medical Center of New York, Cronin 10 Auditorium, 153 W. 11th Street, New York. For information write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104.

Four Days of Cardiology

The American Heart Association Council on Clinical Cardiology will present *Advanced Electrocardiography,* May 10-13 at Grady Memorial Hospital Auditorum, Atlanta, Georgia. Write to: Miss Carole Mintz, Department of Medical Education, American Heart Association, 44 East 23rd Street, New York, N. Y., 10010.

Reserve Forces Symposium

Physicians, nurses and other members of the medical profession affiliated with the Air National Guard and Air Force Reserve are invited to attend the Eighth Annual Reserve Forces Medical Symposium in conjunction with the 42nd Annual Scientific Meeting of the Aerospace Medical Association in Houston, Texas, April 26-29 at the Shamrock Hilton Hotel. Contact Alvin M. Burner, Col, USAF, MC, Chief, Medical Division, Office of Air Force Reserve, Washington, D. C.

David Flett duPont Lecture

Annually the Delaware Heart Association presents the *David Flett duPont Memorial Lecture.* The 1971 lecture will be held in two separate sessions on Saturday, April 24 at nine a.m. The program for M.D.'s is *Office Problems in Pediatric and Adult Cardiology,* and they will meet at the Academy of Medicine. The program for R.N.'s is *Nursing Aspects of Cardiovascular Disease,* and they will meet at Wilcastle Center on Pennsylvania Avenue. Kenneth M. Corrin, Jr., M.D., is chairman of the lecture this year.

Legal Notes on Abandonment*

Abandonment has been defined by one court as "a failure by the physician to continue to provide service to the patient when it is still needed in a case for which the physician has assumed responsibility and from which he has not been properly relieved."

When a doctor doesn't respond to a patient's demand for medical attention, he is abandoning the patient in a legal sense if both the following factors are present: 1) The patient must have a genuine need for the attention he demands, and 2) A previously created relationship between doctor and patient must be in effect when the demand for treatment occurs.

Here are six rules that the physician can use to protect himself against abandonment charges: 1) If you intend to limit your services in any way, say so *before you start treatment.* To be safe, state your limitation in writing or in the presence of a witness other than your aide.

2) When advising a patient that treatment is completed, let your office records indicate the reason.

3) If you want to drop a patient for nonpayment of medical bills or for other reasons — such as refusal to accept your advice, making unreasonable demands or constantly breaking appointments — send him a *registered letter with return receipt requested.* Offer to remain available for a reasonable time, during which the patient can find another physician. If the patient needs further medical care, inform him fully and keep a record of the advice you gave him.

4) When a patient dismisses *you,* send him a letter confirming the break in your relationship and keep a copy on file.

5) If you know you are going to be out of town, have your aide notify *all patients who are acutely ill, convalescing from operations, pregnant, or subject to chronic disorders.* Give them the name, address and phone number of a competent physician who has agreed to cover for you.

6) Make sure that any decision to deny a patient's request for attention is based on *medical judgment.* Courts have often ruled that you can't refuse to treat a patient merely because you are occupied by other patients. If possible, have another doctor substantiate your reason for denial.

*Excerpts from *Medical Malpractice: Risks, Protection, Prevention,* Medical Economics Book Division, Inc., Oradell, New Jersey, 07649.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of .30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

GENERAL SURGEON: Board eligible. Interested in group or solo practice. Available in June. Graduate, University of Haiti. 7 years' residency, including 4 years in Philadelphia. Passed ECFMG.

PATHOLOGIST: Certified in Anatomical Pathology, eligible in Clinical Pathology. Graduate, University of Santo Tomas, Philippines. American internship and residencies. US citizen. Available June.

INTERNIST: Board eligible. Interested in small or medium-sized community, either as associate or solo. Graduate, Hahnemann Medical College. Available October.

INTERNIST: Board eligible. Currently serving as Nephrologist in Vietnam. Available September. Interested in General Internal Medicine with some or a majority of time in Nephrology. Yale graduate.

PATHOLOGIST: Philippine-educated, board eligible. 5½ years' American postgraduate training. ECFMG certified. Immigrant visa. Available July.

The Physician and The Pharmacist

A monthly feature of the Delaware Pharmaceutical Society

TRIMETHADIONE · PARAMETHADIONE

Teratogenicity

Data presented by the authors strongly point to oxazolidine-2, 4-diones (drugs prescribed for the control of petit mal seizures) as a cause of clustering of congenital abnormalities observed in two families. The mother in each had non-familial petit mal, and each mother took trimethadione (*Tridione*) or the closely related drug, paramethadione (*Paradione*) during a total of nine pregnancies. All of these pregnancies ended in the birth of an abnormal child or in spontaneous abortion. When these drugs were withdrawn, all pregnancies ended with the birth of normal children. "A conclusion concerning the teratogenicity for man of the oxazolidine-2, 4-diones must await more data. Furthermore, it will require more data than are available at any one medical center. We would welcome communications from others concerning the outcome of pregnancies of mothers who took trimethadione."

German J, et al: Lancet 2:261, 1970.

Fixed-Dose Combination of Drugs

The AMA Council on Drugs restates its attitude on the use of fixed-dose combinations of drugs. Some comments in this current re-examination are as follows:

1. "*It is well recognized that drug interactions may result in unexpected or even unique adverse reactions resulting from the simultaneous use of more than one drug.*"
2. Fixed combinations "*deny the physician the needed flexibility to adjust the dosage of each drug according to the patient's need.*"
3. While "*Broad Spectrum*" coverage may be considered desirable to "*cover*" as many pathogens as possible, "*the first principle of treatment is correct diagnosis.*"
4. In some instances two or more drugs used in combination may each be used in smaller doses than would be necessary if only one drug were used. However, situations in which only the doses of the fixed-combination drugs are applicable are rare and "*cannot be justified.*"
5. "*It is frequently stated that two or more drugs may be formulated into a single dosage form, . . . at less cost and with more convenience than if they are prescribed separately. However, reduction of costs can be more effectively accomplished by using drugs that are specific.*"
6. "*The reason most often cited for using certain combinations, for which there is little or no scientific basis, is that they are effective, since so many of them have been used with apparent good results.*"
7. "*The false sense of security endangered by fixed combinations, . . . discourages specific etiologic diagnosis, encourages irrational drug usage, and may harm the patient.*"
8. "*The effects of drugs are intrinsically so complex that it is generally advisable to administer multiple agents separately in order that dosage and frequency of administration of the individual drug may be varied in accordance with the patient's requirements. Combinations or mixtures containing two or more active ingredients in fixed ratios are in most instances not recommended by the Council.*"

AMA Counc on Drugs. JAMA 213:7, 1970.

AMITRIPTYLINE — Cardiac Disease

A drug information system was used to investigate a suspicion linking unexpected death following the administration of amitriptyline *(Elavil, Etrafon, Triavil)* in patients with heart disease. Six of 53 heart patients died suddenly and unexpectedly after administration of the drug, compared with none of 53 controls matched for age, sex, diagnosis, and length of hospitalization. This high frequency of unexpected death was not found in patients receiving imipramine *(Tofranil)*, nor in patients without cardiac disease receiving amitriptyline. Amitriptyline should be used with caution in patients with cardiac disease.

Coull DC, et al: Lancet 2:590, 1970.

Win, Place and Show

182nd ANNUAL MEETING, MEDICAL SOCIETY OF DELAWARE

Applications for SCIENTIFIC EXHIBITS for the Annual Meeting of the Medical Society of Delaware are invited by the Scientific Exhibits Committee.

It is hoped the exhibit portion of the Annual Meeting to be held at DOVER DOWNS IN DOVER, OCTOBER 9, 1971, will be the stimulation to demonstrate scientific achievement of members, interns and residents. Allied health personnel are also to be encouraged in their medical pursuits.

Professional assistance is available in graphic arts, booth construction, and photo reproduction through the following:

1. Opportunity Center
2. Photo Art Inc.
3. Allied Arts and Exhibits, Inc.
4. Mr. Hugh Roberts, Consultant — 652-1181

Mail APPLICATION to the Medical Society of Delaware, 1925 Lovering Avenue, Wilmington, Delaware 19806.

SCIENTIFIC EXHIBITS
APPLICATION FOR SPACE

182nd Annual Meeting, Medical Society of Delaware

Dover Downs, Dover, Delaware

October 9, 1971

1. Title of Exhibit: ______________________________
2. Name(s) of Exhibitor(s): ______________________ Degree: ______
   Institution or Organization (if desired): ______________________
   City ______________________ State __________ Tel. No. __________
3. Exhibit is Free-standing, Self-contained ______________________
4. Size of Booth Requested: (Absolute Maximum: Length 10′, Depth 6′). __________
5. Description of Exhibit: (Attach a brief description telling the purpose of the exhibit, what the exhibit shows, and the conclusions reached.)
6. Photograph or sketch of exhibit should accompany this application.

Deadline for Filing Applications, May 15, 1971.

THE FORUM

Environment And Health

SOCIOLOGICAL FACTORS IN POLLUTION

JERE HOOVER

The continuing public dialogue about air pollution sometimes seems the product of a not altogether comfortable mixture—one part crisis, one part ignorance, and one part legitimate concern about a real, worldwide problem.

The trouble with regarding air pollution as a crisis demanding all sorts of emergency action is that, for many people, the sense of crisis overpowers the capacity to think and act rationally, or even to think and act at all. The result all too often is that the dialogue deteriorates into a contest over who can predict the direst consequences which we will be helpless to avoid. Such discussion is really a recipe for paralysis offering little hope for improving either the public morale or the public air.

On the other hand, some parties to the discussion apparently feel we are still living in the best of all possible worlds where patience alone will lead to the resolution of all problems, including the problems of air pollution. These are the people who don't want to be bothered by facts.

But the facts remain, and they are bothersome. Air pollution has been a problem at least since King Edward I of England made it a hanging offense in 1772 to burn a smoke-producing type of coal. And the problem grows worse. The United States alone pours more than 200 million tons of gaseous, solid and liquid pollutants into the air every year. And somehow we still have to breathe.

The very industry that has blessed the land with a prosperity unparalleled in history curses the air with carbon monoxide, sulfur oxides, nitrogen oxides and fly ash from imperfect combustion, as well as solid particles from various grinding operations and vapors produced where liquids are transformed into gases. Sometimes primary pollutants react with each other to produce even more dangerous secondary pollutants.

And industry is not alone. We all contribute to the burden the air must carry every time we switch on the inefficient internal combustion engine we use to power our autos, mowers and outboards. Even nature gets into the act when meteorological and topographical conditions occasionally prevent the air from moving normally and allow pollutants to concentrate to dangerous levels.

To everyone in the field of health care, air pollution is grounds for legitimate concern. Some pollutants aggravate lung illness and disturb lung function. Others can irritate the upper respiratory tract, the eyes, the nose and throat. Still others can cause headaches, dizziness and nausea, reduce the oxygen content of the blood, or impair mental processes. And the effects can be drastic; smog in London in 1952 was credited with 4,000 deaths, while a New York air episode took 400 lives in 1963.

The dimensions of air pollution are serious, but we must translate our concern into research, hard work and common sense, not panic, if we are to achieve cleaner air. That requires *informed* leadership, and that's where the professional health care community can find both great opportunity and great responsibility. The public is ready; if we have a true crisis, it will be one of leadership.

Mr. Hoover is Assistant Executive Director of the Delaware Tuberculosis and Health Society.

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INITIAL THERAPY OF SERIOUS BACTERIAL INFECTIONS

• **Many times clinical urgency necessitates the choice of a treatment regimen for infection before a specific bacteriologic diagnosis is available. Choice of antibiotic in this type of situation is discussed in this paper.**

Christopher M. Martin, M.D.

The initial therapy of serious bacterial infections must often be chosen before a definitive bacteriologic diagnosis has been made. This initial therapy demands a choice of antimicrobial regimen which is reliable, ie, can be expected to act against all likely pathogens; has a tolerable toxicity; and, ideally, has activity against possible unsuspected pathogens, and so covers alternative etiologic possibilities. An example of this last situation is septic shock, where the presence of a staphylococcus may be overlooked in the face of clinical features which strongly suggest infection caused by a gram-negative rod.

The first group of infections to be discussed are those caused by gram-negative rods. It must be remembered that there are a large number of species of gram-negative rods and that it is impossible to "cure" feces. The fecal flora ranges from the ubiquitous *Escherichia coli* through rarer organisms such as *Serratia marcescens.* In 1966, at the Georgetown Medical Division of the District of Columbia General Hospital, my colleagues and I conducted a controlled clinical trial comparing the efficacy and toxicity of five potent therapeutic agents in the initial therapy of serious acute gram-negative rod (GNR) infections. These agents were cephaloridine, kanamycin, gentamicin, polymyxin B and sodium colistimethate, given alone or in various combinations, to 150 consecutive, presumably infected patients. Of these 150 presumed to have GNR infections, 90 were subsequently shown actually to have had such infections, 30 had infections due to gram-positive or gram-negative cocci, and 30 were not infected. Approximately one-quarter of the patients with GNR infection had *Escherichia coli* as the etiologic agent, an incidence which demonstrates that *Escherichia coli* is less common in the serious GNR infections in inpatients. Analysis of the data from the study revealed that disease severity and patient characteristics were about the same in all antibiotic groups; nevertheless, the lowest death rates were in the gentamicin and the gentamicin plus cephaloridine groups. There was no real therapeutic difference in any of the antibiotic groups in patients who were less seriously ill, with neither bacteremia

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nor complicating shock. In those with positive blood cultures, however, the mortality rate was 15% in the group treated with gentamicin versus 56% in the pool of patients receiving non-gentamicin therapies. When shock was present, there was a 24% mortality on gentamicin versus 67% mortality on other therapies. In patients with both positive blood cultures and shock, the mortality rates in the gentamicin and non-gentamicin groups were 18% and 75%, respectively. Toxicity comparison revealed negligible renal toxicity from cephaloridine, approximately 6% toxicity with gentamicin, and the highest incidence of renal toxicity (21%) with kanamycin.

The Power of Antibiotics

In vitro studies of the killing power of the various antibiotics used in the trial demonstrated that the various antibiotics require different intervals of exposure to sensitive bacteria to exert their killing effects. Following up observations first made by Dr. George Jackson at the University of Illinois, we found that gentamicin has the shortest period, requiring only five to ten minutes to cause irreversible bacterial death, whereas kanamycin requires approximately one to one and one-half hours, cephaloridine two-three hours, and polymyxin and colistin five-six hours. The reason for these various speeds of action is at the present time undelineated. However, these observations support the clinical data which suggest that the best initial therapy of serious GNR infections is probably gentamicin with or without cephaloridine as an additional agent, pending the outcome of culture and sensitivity studies.

The second large group of serious infections requiring immediate therapy are those presumed to be gram-positive coccal (GPC) infections. A controlled, double blind trial of penicillin versus the semi-synthetic penicillin nafcillin and of methicillin versus nafcillin demonstrated that in lobar pneumonia or bronchial pneumonia which was due to the pneumococcus there was no appreciable difference in mortality between penicillin and nafcillin. In staphylococcal pneumonia, there was no significant difference between methicillin and nafcillin. In staphylococcal pneumonia misdiagnosed on admission (a very common occurrence), there was an alarming mortality of six of the seven cases who were initially treated with penicillin but only one death resulted among the seven who were initially treated with nafcillin. The above data have since been confirmed. It is thus very important to make an initial accurate diagnosis of staphylococcal infection or else to cover by the use of nafcillin or some other semi-synthetic penicillin. It is also important to realize that in the best of hands, the diagnostic error in reading the initial gram-stained sputum approaches 40 to 50%. In addition to nafcillin, there are available at present oxacillin, cloxacillin, cephalothin, and cephaloridine. Nafcillin or one of the alternatives above is especially indicated in the initial therapy of, for example, the older patient with scanty sputum and a less clearly delineated pulmonary infiltrate, in whom staphylococcal infection may be difficult to demonstrate and easy to overlook.

The rational therapy of skin infections before specific bacteriologic diagnosis is known is dependent on a knowledge of the most probable pathogen. Since cellulitis is usually caused by staphylococci or group A streptococci, a semi-synthetic penicillin like nafcillin or one of the cephalosporins is indicated. Furuncles are most likely due to staphylococci, and therefore the same agents are indicated. Infected burns may be expected to be colonized with *Pseudomonas*, group A streptococci or staphylococci and also require semi-synthetic penicillins or cephalosporins plus an anti-*Pseudomonas* agent such as gentamicin or a polymyxin. Traumatic wounds, which may have in addition *Clostridia*, should be treatd with penicillin plus gentamicin; infected decubitus ulcers — commonly containing staphylococci and gram-negative rods — are best treated initially with gentamicin plus either a semi-synthetic penicillin or a cephalosporin.

Bone infections, since they are usually caused by staphylococci, are best treated with a semi-synthetic anti-staphylococcal penicillin. However, osteomyelitis occurring in association with sickle cell disease is frequently due to *Salmonella*, and the therapy of choice is thus chloramphenicol in addition to a semi-synthetic penicillin or gentamicin plus a semi-synthetic penicillin. Similarly, bone infections acquired after orthopedic surgery should be treated with gentamicin plus a semi-synthetic penicillin (gram-negative rods and staphylococci most commonly involved).

Severe genital infection, if thought to be gonorrhea, should be treated with penicillin. However, septic abortion, puerperal infections, or ruptures of the GU tract frequently involve anaerobic organisms and should therefore be treated with semi-synthetic anti-staphylococcal penicillin plus gentamicin.

A Most Serious Infection

Acute meningitis is one of the most serious infections requiring immediate therapy. In the adult the probable pathogens are the meningococcus or the pneumococcus, and the therapy of choice is penicillin or possibly ampicillin as the first agent. In children more than one month old, ampicillin is the present agent of choice because of the frequency of *Hemophilus influenzae* infection, in addition to pneumococcal and meningococcal infection. In the newborn, because the infecting agent is almost always a gram-negative rod, gentamicin is the agent of choice. After neurosurgery, where staphylococci in addition to gram-negative rods are common, gentamicin plus a semi-synthetic anti-staphylococcal penicillin should be used.

There is some good evidence to suggest that gentamicin may be unique among the antibiotics in the rate at which resistance to its action is acquired by sensitive bacteria. Resistance development in the streptomycin family of antibiotics is due to the presence of a hydroxyl group in the three-position of the amino-sugar portion of the kanamycin, streptomycin and neomycin molecules. Bacterial resistance is characterized by the ability to acetylate, phosphorylate, or adenylate this hydroxyl group, and thus inactivate the antibiotic. Fortunately, this vulnerable hydroxyl group is not present in gentamicin.

The biggest defect in the gentamicin spectrum is its inactivity against *Bacteroides*, a cause of infection which is still uncommon but does present especially after trauma or abdominal surgery. The therapy of choice for *Bacteroides* is tetracycline or chloramphenicol. The therapeutic prescription of gentamicin plus a semi-synthetic penicillin is not without risks. Because of the broad antibacterial activity of this combination, superinfection by fungi or latent viruses may occur; therefore this regimen should be continued for only three to five days or until the specific infecting organism has been defined and less toxic antimicrobials can be substituted. Gentamicin is not approved by the FDA for intravenous use but has nevertheless been prescribed as a slow intravenous infusion with, as yet, no reports of toxicity such as the apnea which may develop after rapid intravenous infusion of kanamycin.

The therapy of subacute bacterial endocarditis has classically been therapy directed against viridans streptococci (alpha-strep). However, although these are still the usual organisms in SBE superimposed upon rheumatic heart disease or congenital valvular disease, there is an increasing frequency of non-streptococcal endocarditis, especially in the heroin addict, in whom a wide range of pathogens has been isolated. In most series more than 50% of cases of endocarditis in addicts are due to *Staphylococcus*, 25% to GNR, and about 5% to fungi. The initial therapy of choice for this type of acute endocarditis is an antistaphylococcal drug such as semi-synthetic penicillin plus an agent such as gentamicin which can be expected to have high activity against gram-negative rods.

Summary

In summary, choice of initial therapy when a pathogen is unknown hinges on clinical astuteness in the evaluation of the history, physical examination, and gram stain together with a knowledge of which kinds of organisms are most likely to be involved. This choice changes from year to year; the preferred therapy of human infections must keep pace with the emergence of various resistant organisms.

MEDICINE IN AUSTRALIA TODAY

• Australian medicine is an outgrowth of its history, society and geography. A review of Australian experience may have some lessons for those interested in the evolution of health care systems in the United States.

Alister Brass, MA, BM, BCh

When it was suggested I might like to come to Wilmington to address this meeting, I must confess my heart sank into my boots. What could I, a very recent arrival in your country, have to offer this gathering in the way of useful information, apart from the entertainment value of a strange accent and a peculiar vocabulary? But then I realized that by a lucky coincidence, 1970 happens to be the bicentennial of the official discovery of Australia. So I am going to try and sketch for you something of the flavor of life in Australia, give you some information on the state of Australian medicine, and — taking as my excuse the passage of those two hundred years — burden you with some key events in the history of the country which is famous in England for playing a game called cricket, in the United States for excelling at tennis, and in Southeast Asia (of which it is by the laws of geography, if not of race, inescapably a part) as the only friend America has west of Waikiki.

When I implied a moment ago that Australia was *un*officially discovered *before* 1770, I am not intending to diminish the crucial nature of that sighting at 6 am on the morning of Thursday, April 19, 1770, from His Majesty's Ship "Endeavor" of "land . . . made in sloping hills, coverd (sic) in part with trees or bushes, but interspersed with large tracts of sand." Captain James Cook's encounter with the east coast of Australia was without question the start of the continent's emergence from the realm of fantasy into the prosperous nation of some 12 and a half million inhabitants Australia is today.

But there *had* been earlier sightings of the "great southern land," which for as long as Europeans had sailed southern seas rumour had it lay between the rich islands of the East Indies and the roaring 40's. In 1605, four years before Hendrick Hudson discovered Delaware Bay and the Delaware River, two Portuguese captains sailed from Peru under the flag of Spain to search for the "*terra Australis incognita*," but they steered too far north, missed Australia completely, and circumnavigated the island of New Guinea instead. A Dutchman inspected the Gulf of Carpentaria (that great bite out of the continent between the plateau of the Northern Territory and the peak of Queensland) in the same year, encountered a number of natives, crocodiles, and mangrove swamps, and wisely decided the place was not fit for civilized habitation — a conclusion which only the recent discovery of bauxite in the area has reversed. Also, by hazard, Jonathan Swift, writing 44 years before Cook discovered the east coast, placed the mythical land of Lilliput at the 30th parallel of latitude, smack in the middle of Australia, near the present town of Alice Springs.

No, it is James Cook, a Yorkshireman of humble origin who rose through hard work and application to duty to be given command of a scientific expedition that has been called the 18th century equivalent of Apollo 11, who

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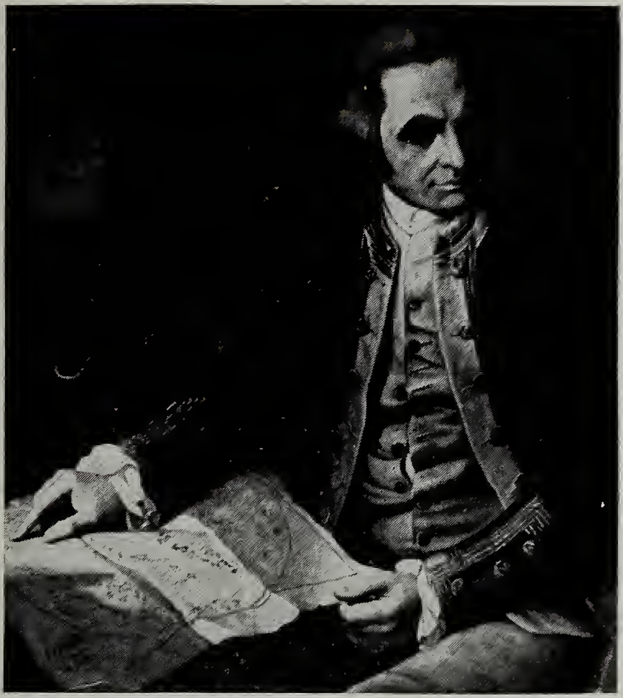
This paper was delivered at the Annual Meeting of the Medical Society of Delaware, October 17, 1970.



Captain James Cook — 1770.

is rightly remembered as the man who discovered Australia. Cook had, as a young seaman, established a reputation in the British navy as a cartographer and astronomer. It was he who charted the reefs and shoals of the St. Lawrence River in 1759 so well that General Wolfe was able to surprise and capture Quebec from Montcalm and the French. When a scientific expedition was planned to observe the transit of Venus from the island of Tahiti on June 3, 1769 (the transit of Venus, which occurs only three times in a hundred years, enables one to take measurements to determine the exact distance between the sun and the earth), Cook was chosen to captain the converted coastal collier which had been renamed "Endeavor" for the occasion.

Cook and his passengers — the most noteworthy of whom were Joseph Banks, a rich and brilliant young scientist who lived to become one of the leading botanists of his day, and the Swedish Dr. Carl Solander, a pupil of Linneaus — carried out their mission in Tahiti, established very friendly relations with the local inhabitants (even Cook's generally impersonal journals attest to this), and then sailed west under secret instructions from the British admiralty to find the missing continent.

After that first landfall near present-day Sydney at Botany Bay — Banks and Solander had a heyday collecting strange plants and the place was named accordingly — Cook explored the coast northwards, ran aground on part of the Great Barrier Reef, patched up the ship at Cooktown in Queensland, successfully navigated the remainder of these treacherous waters, and then unfortunately put into Batavia in Java, where he lost several members of his crew through "fever" and "the bloody flux," including his medical officer.

I mention this disaster to contrast it with the crew's experience during the earlier part of the voyage. Cook never lost a crew member through scurvy, a remarkable record for the 18th century, and he was later awarded the Copley Gold Medal of the Royal Society for his success in this preventive measure. (Perhaps I should mention here that Cook's technique of persuading the crew to take the unholy mixture of malt and sauerkraut he considered prophylactic for scurvy [he was not aware of, or in agreement with, the earlier work of James Lind showing the value of *limes* in scurvy] was to dress the stuff up as gourmet fare and serve it to the officers only, who were doubtless instructed to smack their lips eagerly at the reeking prospect. As Cook — a wise observer of human behavior — had calculated, the men angrily insisted they too should be given any delicacies being served to their superiors, a request he gladly acceded to.)

Just what had Cook run into that early fall morning in April, 1770? (The seasons are, of course, reversed in Australia, although 20th century Australians still celebrate Christmas by consuming traditional English roast turkey and plum pudding, even if the temperature *is* 105° in the shade; like most "new peoples," we Australians tend to cling fiercely to the most inappropriate traditions from the old country.)

Australia, in many ways, was a terrible disappointment. Those who had looked for a new New World — a second America — with

Immediate advice is given to emergency calls so that treatment can begin before the Flying Doctor arrives.

wide rivers, fertile plains, and great mountains just waiting to be occupied by civilized men (no one considered the curious naked inhabitants, the Aborigines, as being much higher than the other strange fauna: the kangaroos that hopped in herds across the scrubby, dry land; the stupid, sleepy koalas clinging to their gum trees almost inviting the clubs of the sailors eager for blood sports; the strange duck-billed platypus, half bird, half otter, that snorkeled under the banks of the few streams) — these hopeful explorers came several million years too late. Once, the continent — which is the size of the United States minus Alaska — had sported great mountain ranges, forests, and rich soil. But over countless milennia, the sun, the wind, the gradually diminishing rains had worn the country down into a bare, barren, brown desert land what one of our poets has termed "the sunburnt country." Only along the coast, stretching inland for a few hundred miles from the ocean, is the land green and inviting. Even there, the rainfall is erratic, and droughts months or even years long can wither transplanted European crops, leaving only the perennial gray/brown, monotonous "bush," that collection of eucalyptus and similar trees that have evolved with the rest of the country to survive the impossible climate.

Ruefully acknowledging the inhospitable nature of its new colony, the British made the best of a bad job and decided it was just the place to unload some of the many convicts who were overcrowding the jails at home. A "first fleet" of eleven small ships, frugally victualled, ill-found and parsimoniously outfitted sailed for the new colony of New South Wales seventeen years after Cook landed. Seven hundred seventy-eight of the complement of 1,473 souls were convicts; the remainder were jailers and garrison. The fleet anchored in January 1788, inside Port Jackson, and set up a grim encampment in what is today downtown Sydney. They barely survived the first winter — mild, I should point out, by European standards, with no snow, just the occasional frost, and beautiful sunny days if one had time to admire such things. The hoped-for second fleet arrived from home many months later. This was almost as poorly supplied as the first had been and contained an equally ghastly company of sick and dying convicts but increased the complement of felons and their warders to a viable level.

Slow Growth of Settlement

The settlement grew slowly and painfully. Several decades passed before the Blue Mountains, a mere 50 miles west of Sydney, were explored and finally crossed, to reveal the rich grasslands beyond. The introduction of fine-wool sheep in 1796 saved the country from remaining just another penal colony. Nevertheless, until the time of the gold rushes in the early 1850's, Australia remained remarkable to the eyes of all overseas visitors for the drunkenness and profanity of its people, the looseness of its women (who were, and still remain today, outnumbered by men), the crudity of its social manners, the shakiness of its ethics and morality, and the sturdy independence of its people. And certainly, that intense individuality and disdain for relying on others that label a man an Australian, (or so we Australians like to imagine), grew up of necessity with the constant battle waged against the unkind land from the start. Toughness is still needed today away from the comforts of the big cities; Australia was

Flying Doctor attending a patient on flight back to a base at Broken Hill, New South Wales.

a hard, rough country 200 years ago, and is still a hard, rough country today.

The lie of the land has affected every aspect of Australian life, including Australian medicine. In the cities, which gradually became established along the coast as exploration continued and new natural harbors were discovered, young physicians from England set up practice. They became, naturally, leaders of the community, in company with the governing officials and the occasional schoolmaster and clergyman daring enough to brave the "colonies," usually the last resort of the black sheep of the family. Many of the early physicians were ship's doctors who stayed on in port when their vessel sailed. Immigration in those days, indeed, until just before the last war, was almost entirely from Britain and Ireland.

The pattern of medicine was that of 19th century England, though naturally with a provincial flavor. The physician needed to have his wits about him, be inventive and innovative where recourse to higher authority was lacking, and make his mark on the community as best he could. Away from the cities, the physician was an equal pioneer with everyone else.

These are still the characteristics of the contemporary Australian physician. Especially in the country towns which are often hundreds of miles apart and where life revolves around the size of the year's wheat harvest or wool clip, the physician is a leading man in the community. But his responsibilities are broad — from attendance at the local hospital, to paying house calls many miles out into the country, to chairing the local school board. Unfortunately, this sort of practice appeals a lot less to present-day graduates than it did to their fathers and grandfathers. The country towns of Australia are now desperately short of physicians. And, as the older men retire, or a man decides his family needs the opportunities for education and social life that the cities offer and moves away to the coast, the situation deteriorates. The pattern is one which you know well in the rural parts of this country. And in Australia, which is short of medical manpower just as you are here, no easy solution to the emptying countryside and filling cities has been found.

One of the outcomes of having to practice medicine across the vast distances of the inland has been the use of radio and aircraft as accessories to the doctor's bag. For despite the harshness of the inland, people have spread out, especially in Queensland, the western parts of New South Wales, the Northern Territory, and the north of Western Australia, and have established cattle "stations" (as we call ranches) sometimes up to 12,000 square miles in extent. Many of these stations, I may add, have been bought by American interests, and several American families have now joined the old established Australian families by becoming "graziers." Under these circumstances, the radio forms the only link a family has with the outside world, often for months on end. The wives on the various stations link up every morning for a gossip session across thousands of miles, children on outback properties receive part of their schooling by special radio programs, and the physician or nurse at the base hospital serving the region (which may be the size of Texas) gives first aid and medical advice by radio, instructing the family to use some of the standard medical supplies each household carries for emergency use.

Today serious cases can receive actual as opposed to ethereal medical attention thanks to the Flying Doctor Service. On receipt of a radio call, a physician and his pilot fly in a specially equipped light plane to the patient's bedside. If the case is serious, the patient is brought back to the base hospital for treatment, or sent on by plane to a city for specialist care. The system, which today covers every station in the outback, grew out of the pioneering work of the Rev. John Flynn, a Presbyterian missionary, who began to organize the radio networks in 1915. In 1928, the first experimental aerial medical service base was established at Cloncurry in western Queensland. Today, the government and not the church runs the Flying Doctor Service, and there are some added sophistications: needy children are brought from the outback to the coast for convalescence and their first glimpse of the sea, specialists are flown out to the base hospitals on the theory that it's better to bring medical care to the patient than the other way around. But without the foresight and drive of Flynn, the whole scheme might never have started at all.

Patient receiving emergency dental treatment. The dentist is primarily concerned with care for school children in the outback, but joins the Flying Doctor in mixed clinics and emergencies.

Perhaps at this point I should mention, as an illustration of what I mean about the continuing innovative tradition in Australian medicine, a few names that will be familiar to many of you — Australians of international reputation in our profession: Hugh Cairns, who pioneered the field of neurosurgery during the first World War; Howard Florey, who took up where Fleming left off and developed penicillin from an interesting mold into a revolutionary medical weapon; Norman Gregg, an ophthalmologist who thought it strange that many mothers were bringing babies with cataracts to his office some months after a rubella epidemic, and bothered to find out why; Macfarlane Burnet, a magnificent microbiologist and the man who placed Melbourne's Walter and Eliza Hall Institute for Medical Research at the top of the world list in immunology.

In the cities and big towns of Australia, I venture to suggest any of you here today would feel immediately at home, both in the medical setup and in the communities themselves. Some of you probably visited Brisbane, Sydney and Melbourne during the war, when both were liberty towns for the many Americans serving in the Pacific Theater. The flavor of life is, I hope, still distinctly Australian, though there is an American garnish that seems to be growing stronger every year. There is an accent on the outdoor life — swimming, sailing, golf, tennis, going on picnics — which I have found equally insistent in this country. Everyone who can has his own garden, lawnmower, and car. Of course, the climate helps! For instance, just north of Sydney is a fine wine-growing region, the Hunter Valley, though it is not as extensive as the vineyards of South Australia where German settlers have been growing superb vintages for 100 years, and many people, including a remarkably high percentage of physicians, have taken to being weekend vignerons: buying a few acres, planting their grapes, and, after a year or so, proudly pressing their own wine!

The Basis of Australian Medicine

Professionally speaking, private practice is still the basis of Australian medicine. About half the country's 12 and a half thousand physicians are general practitioners, usually solo or in partnership. Group practice is only just beginning to catch on, and there have been some taxation battles with the internal revenue people which have delayed the pattern's spreading. The remainder are specialists, full-time salaried officers of the state or federal governments, or both.

Specialists get that way following the English system: by approved postgraduate study and passage of the appropriate examination set by the various specialty colleges. These colleges are direct offshoots of the corresponding British bodies, "The Royal Australasian College of Physicians," "The Royal Australasian College of Surgeons," and so on, and are as fiercely resistant to government and university interference as their parent organizations in London. Until recently, most Australians went "home" to England to obtain their higher qualifications (Australia and England have reciprocal recognition of degrees, which it is high time this country did too), though a few hardy souls went to America. But the rapid growth of acceptable postgraduate courses in Australia since the war is changing this pattern, and Australian "memberships" and "fellowships" are no longer *infra dig.*

In fact, there has been a medical school in Melbourne since 1864 (for once outdoing its rival Sydney, which did not add a medical faculty to its university until 1883). With the opening of a medical course at the University of Tasmania in 1963, the country now has eight medical schools catering to undergraduates, plus the solely postgraduate facilities of the John Curtin School of Medical Research in Canberra.

The hospital scene, lately the source of much haggling between the profession and the government, is still in a state of flux. Private hospitals in Australia are very small-time indeed. Most are no more than nursing homes putting on airs. As in England, one would far rather be a patient in a large state or university hospital than languish in sickly comfort in a private establishment.

However, until lately the states (who run the big hospitals) have relied almost entirely on the voluntary work of "honorary" physicians who spend a few sessions each week on the wards, in the operating rooms, or in the outpatient clinic to provide the necessary specialist expertise. Paid residents and interns do the donkey work, as everywhere. But *noblesse oblige* no longer satisfies the physicians, even if it is an easy way out for the politicians. Specialists are increasingly insistent on being paid a fee for service for hospital duties. The poorly paid fulltime staff man is now beginning to get status appropriate to his qualifications, and a salary to match. On the subject of hospitals, I should mention that since the first World War, the commonwealth government has run a system of "repatriation hospitals" where returned servicemen get the same free treatment meted out here by the VA. The system in Australia has the same advantages — and disadvantages — as that in the USA.

Who Pays?

Which brings me to the matter of who pays for medical care when the patient has not had the good fortune to be a veteran of a foreign war. In Australia, as in the United States, strong emphasis has always been placed on the sacredness of private enterprise, as against the profanity of public welfare. In medicine, this has led to the successful development of private health insurance companies, whose coverage is bought by the majority of the population. One difference between the system there and here, as I understand it, is that the Australian government both subsidizes the private companies very heavily, and also offers income-tax relief to those who subscribe to these organizations. Those who have no health insurance — as here, usually the people who most *need* it — attend the emergency rooms at the local hospital, and are hospitalized, if necessary, as "public patients." Certainly, no one is ever refused medical attention in Australia because he cannot pay, and we are lucky in having no great mass of poor and hungry in Australia. In the end, of course, the state does pick up the tab for public patients by subsidizing the hospitals, but it's still a two level system.

Back in the 1940's, when Britain began its National Health Service and New Zealand's welfare system was already several years under way, there was a move to introduce a nationwide health service in Australia. The idea was successfully aborted by the joint efforts of the Australian state branches of the British Medical Association (they have since broken away completely to become the Australian Medical Association) and the then Minister of Health in the federal government, who happened to be a physician as well as a wily politician.

Since that time, the Australian Medical Association, which represents about 85% of Australian physicians, has kept a close watch on further moves to "socialize" medicine. A number of concessions *have* been made by the profession, namely, the acceptance of a pensioner medical service, whereby the government subsidizes physicians who attend old age pensioners, and of a pharmaceutical benefits scheme, whereby no needed prescription drug costs more than 50 cents per prescription for anybody.

Lately, however, the Labor party (out of office these 21 years at a stretch, mainly because of a disastrous internal split in the party) has been campaigning for a broad national health service covering all citizens, though they were never too specific on how they were going to implement their high ideals. At the last federal election, one year ago, the ruling conservatives (misnamed, for reasons I won't go into here, the "liberal party") were so pressed by Labor that they promised the electorate they *too* would establish a sort of health scheme. (They were also rather vague about details.) Having won the election by a hair's breadth, they hatched a scheme (after some consultation with the Australian Medical Association, which was forced to give an inch or two but managed to hold on to most of the mile) which went into effect on July first of this year.

More Subsidy

The essence of the scheme is "no change, but more subsidy." The government will now further underwrite the private health insurance companies, so that no visit to a GP will cost the insured patient more than 80 cents, no home visit (doctors still make home visits in Australia) more than $1.50, and no operation, however complex or however many people are involved, more than $5.00.

There are, you will not be surprised to learn, a number of catches. First, as the scheme remains voluntary, the indigent and the improvident are no better off as regards medical care than they were before. Secondly, the schedule of benefits the government will pay will remain as low as I indicated above only so long as the physician charges the patient the "most common fee," an average worked out by computers for each type of service for each state in the commonwealth (there are some minor variations in fees from one state to another). There is presently some dispute over what happens if

(*Continued on next page*)

Letters to the Editor

To the Editor:

The Delaware Public Health Association was organized to create a forum through which all persons interested in public health could meet, exchange ideas, learn of current programs in health, and discuss mutual problems. The current President of the Delaware Public Health Association is Dr. Albert L. Ingram.

If you are not a member, you may join by making out a check for $5.00 to the Delaware Public Health Association, which covers 1971 dues. Send this check, along with the address to which you want D.P.H.A. mail sent, to the Delaware Public Health Association, in care of the Health Planning Council, Inc., 103 West 7th Street, Wilmington, Delaware 19801.

We believe practicing physicians will be interested in our programs, especially those dealing with Delaware's effort to adjust to changing demands in the delivery of health services.

Mr. Richard R. Griffith
Chairman, Membership Committee
Delaware Public Health Association, Inc.

* * *

MEDICINE IN AUSTRALIA TODAY

(*Continued from page 100*)

the physician raises his fees above the "common" level — as, of course, he is perfectly entitled to do when he considers it necessary. Thirdly, there has been a great outcry from the general practitioners. Eighteen months ago, they formed a break-away organization to fight for GP interests, alleging that the Australian Medical Association was only concerned with specialist interests. Their fears, to some extent, were justified, though the scheme the government adopted was not the same as the AMA had proposed, because the $5 fee I mentioned above is the maximum payable by the patient, regardless of whether the procedure in question is performed by a GP (and many Australian GPs still practice some surgery, do ECGs, etc.) or by the leading specialist in town. Quite apart from whether you think GP's should or should not play part-time specialist, you will appreciate their present anxiety in Australia, and their fears of coming extinction as nobodies in a medical world where everyone is somebody.

But the scheme, such as it is, is still in its infancy, and we must wait and see how it works out. I imagine, from the way things are going in this country, you also will be watching very closely to see the outcome of the latest Australian experiment.

Requests for reprints to Alister Brass, Division of Scientific Publications, AMA, 535 N. Dearborn, Chicago, Illinois, 60610.

WITH 20/20 CONSCIENCE

It seems that these days there are more and more philosophical problems in medicine. At times, it is difficult for a physician to know just what course to pursue, even though his motives are excellent and his conscience is 20/20. A code of ethics has been extant in medicine since Hammurabi, through Hippocrates, to the present time. With the advent of heart transplants and the population explosion, our views are bound to change on such subjects as death and abortion. Every sin was once a virtue. Hippocrates abhorred "cutting for stone." How would he feel about heart transplants?

A. T. Harren, M.D., Medical Opinion & Review, September, 1969.

DESIGNING A MODERN HOSPITAL:
A PHYSICIAN'S POINT OF VIEW

• **New hospitals may be structured in totally new ways. Dr. Waisbren suggests an interesting and totally different new design.**

Burton A. Waisbren, M.D., F.A.C.P.

The following ideas for a truly modern hospital developed out of my concern for treatment of individual patients and were distilled in association with administrators and hospital planning consultants. Admittedly this distillation is a little strong for most administrators and almost overpowering for traditional hospital planners.

My suggested program can best be outlined by following a patient from the time he enters my "modern hospital."

The first step is the Triage Room. Into this room come all admissions to the hospital. It is staffed by a military receiving station sergeant-type who will have been delegated complete authority by the Chief of the Medical Staff. There are two entrances. The first entrance is for elective patients who have been screened by the Admitting Office. This Admitting Office is staffed by a hospital administrative assistant or an intern in hospital administration who is trained in overall hospital problems and is treated as a key employee with respect to salary and benefits. Patients processed by the Admitting Office will have had social service evaluation prior to admission. The second entrance is for ambulance patients and "street trade."

The Triage Officer will quickly evaluate the patient and then send him out of one of the five doors within a few minutes of the time of entrance.

The Five Doors

Door One leads to the Critical Care Center. Patients who appear likely to die within 12 hours after admission are sent without delay to the Critical Care Center, where physician evaluation will be available and where the organ system that seems about to give out will be treated immediately, whether it be heart, lungs, kidneys, or gastrointestinal tract. At most, five per cent of admissions will be sent here. The Critical Care Admitting Area would be contiguous to the Critical Care Center, which would include the recovery room, acute coronary care area, burn unit, acute trauma unit, pulmonary care unit, acute neonatal care unit, and the intensive care unit.

Door Two leads to the general hospital area. Bed patients, ambulatory patients, and psychiatric patients will be sent to this area, and their location within this area will be determined by balances that are found to be most workable. The general concept is that each ward constitutes a family, with strong and weak members who will be supportive of each other according to their interacting needs. Psychiatric patients will be helped by certain of the ambulatory patients, and they in turn will help certain infirm patients. There will be a common eating area for all who can use it and areas for group therapy sessions, personal interviews, psychotherapy, and teaching machines. It will be possible to change the ratio of private rooms to ward beds according to the need. As will be seen later, this would be easy with all interior walls of temporary construction.

Dr. Waisbren is Director, St. Mary's Hospital Burn Research Laboratory and Associate Clinical Professor of Medicine, Marquette School of Medicine.

This paper was adapted from a presentation to the Department of Medicine, Wilmington Medical Center Conference, May 26, 1970.

The general area will hold bedside nursing machines, and a communications center from which all information will be routed to and from the individual patient's bedside, and from which the ward administrator can make assignments of personnel according to "where the action is." There are no Nursing Stations in the general hospital area. The nurses circulate from bed to bed, getting instructions from the communications center by "walkie-talkie."

Door Three leads to an outpatient area, similar to the British GP's "Surgery." Small lacerations, sore throats, and anxieties will be sent here. This will be staffed by a trained paramedical person authorized to give penicillin, sew up cuts, and refer to social service agencies.

Door Four leads to the outpatient appointment room. People who come to the emergency admission ward but who really need outpatient care will be given appointments to see a physician who is a member of a physicians' group that has agreed to see these patients. Discussion of these physicians' groups is outside the scope of this paper, but suffice it to say these men will have night office hours on a rotating basis for this purpose, in their office building, which is within a few feet of the appointment desk. The appointment clerk will decide the need for evening appointments.

Door Five leads out. Not all who come have to stay, and the Triage Officer will know very soon who to send on his way (any veteran Cook County or Boston City Hospital head nurse can tell him, if necessary).

General Hospital Area

Let us next follow those patients sent through Door Two to the general hospital area. These are the bedfast, ambulatory, and psychiatric patients who constitute 95% of hospital admissions.

From the Triage Room they enter the Laboratory Screening Area. All the equipment in this room is owned and serviced by the hospital. Its standards are quality controlled by an independent agency hired to do this work for a group of hospitals. Each patient's blood is drawn and run through a simultaneous multiple analysis which includes hemoglobin, white blood count, blood urea nitrogen, cholesterol, sodium, potassium, chloride, serum glutamic pyruvate transaminase, and blood sugar. He then receives a screening electrocardiogram which is read by an on-line computer and a full chest x-ray which is sent to the radiologist for an immediate reading. Urinalysis is obtained and blood pressure recorded. All this information is transmitted to the chart within two hours of admission.

Next Step, The Ward

The patient is then taken to the ward. (Special problems of obstetrics and pediatrics will not be discussed here except to say that these areas would not be as rigidly defined as they are now.) Whether he has a private room or ward bed is immaterial, depending on preference and current practice. The patient is introduced to the nurse who will be responsible for his nursing during that shift. The physical setting of the ward will be limited only by the imagination of the interior decorators and architects, but my preference is for soft lights, music, carpeting, and nice art work. His nurse sees that the patient is bedded down and check lists the activities of her shift on a form which is at the bedside nursing machine. She checks the results of the laboratory work and puts into effect contingency orders. For instance, if the temperature is over 101° F, she teletypes the laboratory the "infection diagnosis package" by number; this summons a technician to gather specimens for blood, urine, throat, and stool culture. If the serum glutamic oxalacetic transaminase is elevated, she teletypes the "liver study package" number to the laboratory and liver function studies will be obtained. If the blood urea nitrogen concentration is elevated, she teletypes the laboratory to do the "kidney function package." Alternatively, the laboratory can be programmed and authorized to do these studies automatically.

By the time the physician arrives he can examine the patient with the foreknowledge of the laboratory picture of his patient. He writes his orders at the bedside nursing station, and the nurse teletypes them to the pharmacy. The physician then dictates a paragraph regarding the pertinent points concerning the patient. (The usual "history and physical" is an anachronism, and the time spent in saying "nose and throat are normal" is better spent looking in the nose and throat.) His dictation is typed by the ward transcriber, who also types the nurse's evaluation on the same sheet. The hospital chart, which is at the bedside nursing station, thus consists of progress notes, which doctors, nurses, social workers, and the patient himself dictate, and of laboratory results, which are placed for convenience in reading on a linear horizontal basis (since charges are made by code number in the laboratory itself, laboratory forms do not have to be designed with bookkeeping in mind).

The pharmacy "runner" then arrives and places the medications, which are in unit doses for the shift, in each of the appropriate drawers of the 24 drawers in the bedside nursing station, one drawer for each hour in the day or night.

Each hour the nurse opens the proper drawer; if it is empty, she knows all medications for the patient have been given. We call this "Ferris wheel nursing" to illustrate the fact that each hour a hypothetical wheel turns, presenting the nurse with that hour's medications. With everything for each patient at his bedside station, there is no central nursing station and the nurse spends fifty minutes of each hour going from one patient to another. The last hour of her shift she dictates her nursing report on each patient's tape recorder and then introduces her replacement nurse for the next eight hours to the patient.

The new nurse notes the number of patients she will be responsible for during her shift, listens to the tapes that tell their individual problems, and delegates portions of their care to the trained practical nurses or aides assigned to her for that shift.

Ten minutes out of each hour the nurse goes to the nurses' lounge, to telephone her family, relax, or, if she wants to, play the teaching machine. She leaves the ward at the end of her shift confident that the nurse on the next shift has a taped report regarding any special problems of each patient under her care.

The Nursing Machine or Bedside Station

Fundamental to this proposal is the bedside nursing machine or, if that word is too abrasive, the bedside nursing station. These stations will have to be meticulously designed because they allow the flexibility and mobility which permit the dynamic staffing and placement of patients which are fundamental to this proposal.

These machines should be leased so that they can be constantly updated. They should be graded to provide just enough sophistication and technology to care for the patient at whose bedside they stand.

Specifications for the three basic types of machines can be outlined. The ambulatory patient bedside station will have a place to hold chart and "Cardex," a recorder for dictation by all persons who are to make up the progress sheet of the chart (physicians, laboratory physicians, nurses, workers with social service or physical medicine), two-way teletype for reports from laboratory and x-ray and all off-ward communications, a radio and a small television set to take teaching tapes and closed circuit programs, a small refrigerator for medications, and twenty-four drawers for hourly unit doses to be filled by pharmacy.

The bedside station for the bed-rest patient would have added EKG monitor inputs to be hooked into the "rhythm control room" in the cardiac critical care area. O_2 input may be part of this station, or portable O_2 may be a separate item. However, there will be no central oxygen system so that hospital walls can remain mobile and of the partition type. An alternative to this may be oxygen lines run in the ceiling in a way not to interfere with moving of walls. Intermittent positive pressure respiratory devices will be made a part of the bedside station to eliminate an important cause for patient transfer and potential contamination. Central venous pressure monitoring manometry will also be included.

The critical care bedside station will have all features of the above two stations plus added equipment for arterial blood pressure and blood gas monitoring. This design would be open-ended so that the portable "shock monitoring machine" could be hooked onto it for cardiac output determinations. The critical care bedside station should also have connections allowing it to serve as part of a membrane oxygenator for the purpose of increasing blood oxygenation (artificial lung), artificial kidneys, pump augmentation devices to increase cardiac output (artificial heart), and volume respirators. These latter devices will be engineered to hook into the critical care bedside station as they are needed. Geographically, the portable critical care nursing stations will be located in the area of the hospital considered the critical care area. The types of expertise necessary to care for patients in all of these situations are so similar that in this area both nurses and physicians trained in these aspects of care will be available. The boundaries between the areas will be determined by the number of patients in each category, rather than by any arbitrary bed classifications.

The rare patient who needs isolation because of infection or decreased immunity — and these patients are rare indeed — will be cared for in portable "life island" type of arrangements set up only as needed.

Staffing

To this point I hope you now have in your mind's eye a hospital consisting of an outside shell (beautiful, mind you) whose interior is constantly changed by moving portable nursing stations to patients' bedsides. To understand "staffing" let us examine the communication centers that will replace the central nursing stations. Each ward will have an office staffed by an administrator and ward secretaries. They will use the ward computer to calculate the actual work load on the ward, a load determined by analysis of the elements of the total ward population that cause work. For instance, on the burn ward at St. Mary's Hospital we have determined that the elements of the work load on the ward are made up of the number of patients, their mean age, their mean per cent burn, and their mean nursing category. Therefore, the number of nurses and personnel needed on each shift could be related to the sum of these factors. When the factors that go into making up the work load are determined on each ward of a hospital, the staff requirements for each ward on each shift will become apparent. The ward administrator will then transmit her requirements to the central administrator, who will place incoming personnel on each shift "where the action is." Since nursing will consist of one-to-one relationships with patients and taking care of their requirements, all of which are detailed at their bedside nursing stations, nurses can be sent anywhere in the hospital. The goal will be to qualify as many nurses as possible to man critical care nursing stations, and in-service training to this end would be constantly going on.

All scheduling of nurses, all forms related to charges, and all other requisitions will be handled by the administrative station. This post, I think, is best filled by a nurse administrator who would be in actual charge of the nursing on the ward and who could easily delegate most paper work.

The Patient's Point of View

Let us look at all this from the patient's point of view as he enters the hospital. Initial laboratory work is done immediately so he knows that things have started. Each shift he is introduced to a nurse who is *his* nurse so he can develop a personal nurse-patient relationship. All activity concerning him is concentrated at his bedside so that he is aware of the tremendous effort being made on his behalf. Both his doctor and his nurse will spend more time at his bedside because everything regarding him is there. He knows all medication ordered for him is individualized because it comes from his hourly drawer. If he is able, he eats at a community dining area on the ward. He will feel an organic part of the ward because, if he is able, he can participate in the group therapy sessions on the ward. If he has an emotional illness, he will be able to help those with organic illness and in so doing will again feel more a part of the world of man. He will sense that he is being regarded as an individual, since he will see his physician read his social service or, more ideally, his psychiatric social worker's report on his chart, along with the reports of his physiotherapist, his nurse, and anyone else who is concerned with his care. Finally if the day's work is done, he will be free to leave and sleep at home with his family, knowing that this will not discombobulate the hospital since, if the load index at night on his ward is down, much needed personnel can be transferred to other wards where the load indices indicate they may be needed.

Advantages to Physicians

What are the advantages of this proposed hospital to the physician who, after all, is the final arbitor of delivery of care to his patient? By the time he arrives at the bedside, results of a comprehensive laboratory screen are available to him. He can always find the nurse personally responsible for nursing his patient; he will meet her at the bedside because there is nowhere else for her to be. He himself will spend more time at the bedside with his patient because he, too, will have nowhere else to be when he is making rounds. The simplification of the chart, with typewritten comments by all consultants and ancillary personnel, all on simple progress note sheets, will allow him to remain up-to-date on all that is being done for his patient. Finally the integration into the ward family of a psychiatric social worker, of psychiatric patients, and of psychiatrists will help the doctor to treat his hospitalized patient in greater dimension than is possible while these parameters remain as remote to him as they now are.

What Are the Impedimenta to Instituting This Plan?

It seems to me that the main difficulties in implementation are in loosening attitudes and preconceptions. However, my observations lead me to believe that most people involved in "care" are ready for radical changes because traditional methods are clearly not doing the job satisfactorily. Administrative blockers will, of course, cry that this plan will violate accreditation rules of schools and various other professional organizations. The experience at Boston City Hospital which recently lost its accreditation answers this objection. This venerable and excellent hospital is still functioning and still has one of the most sought after internships in the country. It is my contention that if a hospital is, in the broad sense, providing excellent complete medical care, medical trainees will flock to it, whether or not it is doing this in a manner approved by a remote accreditation body. The emergence of third party payers has provided a new logical watchdog of the quality of medical care. They, as representatives of the patient (or customer), have the right to determine the quality of medical care of their clients. Both the government and the Blue Cross-Blue Shield programs are large enough and sophisticated enough to monitor care, and if a hospital delivers medical care monitored for quality by its own staff and by either the government or Blue Cross-Blue Shield (preferably the latter), it should be allowed to do this in as simple and imaginative a manner as it can. As a physician, I am perfectly happy to have the persons receiving the care and their direct representatives question the quality of the care I give each one of my patients. But on the other hand I, as a physician, am deeply resentful of the time I must spend completing a chart in a manner determined by a remote accreditation committee.

In-service training in a hospital suffers from similar strait jackets imposed by accreditation committees for interns, nurses, practical nurses, residents, pulmonary therapists, and many others. But these will have to be ignored in delivering the in-service training of an imaginative type. Experience in the Milwaukee community suggests that if a hospital is delivering exceptional care, trainees of all sorts come to it regardless of accreditation. In our community, heart transplants, reconstructive cardiac surgery, bone marrow transplants, and care of severe burns are all done in different moderate-sized hospitals without strong academic ties of accredited resident teaching programs. But in each of these hospitals trainees galore have appeared. The emphasis in the hospital must remain the care of patients, and the time-honored, three-cornered stool of teaching, research, and patient care will have to be changed to an upright triangle with patient care at its apex.

Why will this plan have to be seriously considered? The answer to this is simple: it will have to be considered because of the very real possibility that under it quality medical care can be delivered in less expensive physical surroundings by fewer people than is now generally the case. Hospitals will have permanent outer walls and inexpensive temporary partitions within. We are then talking about $16 to $20 a square foot for hospital construction, rather than the conventional figures of many times that amount. Furthermore, remodeling of present buildings becomes much less of an awesome project when decor and temporary partitions are what is desired rather than fearfully complicated fixed service towers that tend to lock medical service into its present structure. If nurses are actually freed of all paper work, they will be able to service more people. Furthermore, shifting personnel "where the action is" will result in more people at work, spending more time working. If these things do occur in hospitals that kick over the traces and try the innovations that have been discussed, it is likely indeed that they will become no longer innovations but accepted practices.

Summary and Conclusions

A plan for a modern hospital that evolved during twenty years of consulting practice in general hospitals has been presented. In it the patient enters a Triage Room from where he is sent out of one of five doors: 1) Critical Care Area; 2) General Hospital Area; 3) Minor Surgery Area; 4) Outpatient Appointment Area; and 5) Exit.

The Critical Care Area has its own laboratory but all patients entering the General Hospital Area go through a screening laboratory area before coming to the ward. The nursing stations in the entire hospital have been replaced by nursing machines at every bedside. Nurses do nursing only; all paper work is done by the administration and communication center of each ward. The severity of the patient's illness determines the sophistication of the nursing machine at his bedside. Nurses are assigned to patients anywhere in the hospital, wherever they are needed. If this plan does in fact save money, space, and personnel and at the same time results in better care, it will achieve general acceptance.

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Highlights

ARTHROSCOPY OF THE KNEE JOINT

S. Ward Casscells, M.D. — *From a paper presented to the American Academy of Orthopedic Surgeons, January 1970.*

During the past two years more than 100 knee joints have been studied using the Watanabe Arthroscope. It has three main uses:

1. *Diagnostic* — In such conditions as meniscal tears, osteochondritis dissecans, chondromalacia and biopsy of the synovia under direct vision.

2. *Follow-up* — In patients who have had prior surgery for damage to the articular cartilage, osteochondral fractures, etc.

3. *Studying* patello-femoral relationships — In the normal state as well as in the dysplastic knee and subluxated patella.

There has been virtually no morbidity in these cases which, for the most part, have been examined as outpatients under general anesthesia. Technical problems with the light carrier which have plagued many users have been overcome by a relatively simple solution.

Some patients are much more difficult to examine than others, and considerable experience is required to perform a successful and thorough examination. Once learned, however, arthroscopy gives the examiner information that cannot be gained by any other means and has proved to be a most useful tool in the orthopaedic surgeon's armamentarium.

AN OVERVIEW OF AMBULATORY MEDICINE, OUTPATIENT SERVICES AND MEDICAL PRACTICES

John D. Stoeckle, M.D., *Associate Professor of Medicine, Harvard Medical School; Physician, Massachusetts General Hospital, and Chairman, Committee on Clinics, MGH — Wilmington Medical Center Conference*, August 4, 1970.

Dr. Stoeckle's discussion began by focusing on outpatient services with respect to four issues: What was the historical approach, what is the current approach, how does one go about reforming problems that exist, and how can the nursing profession help make outpatient services more efficient.

The historical approach for outpatient services was one in which limited accommodations were available, and the primary purpose of the OPD was to control admissions to hospitals. There was little specific interest in preventive medicine, care for the chronically ill, or education of house officers.

The current picture of outpatient services developed after World War II when the need for more complete outpatient care required full-time personnel and medical practices began to locate at hospitals. Services in the OPD began to compete with the private physician in his private office building. At present, six different types of outpatient organizations are available: (1) traditional hospital clinics (The "OPD") staffed by residents, part-time (private) and full-time (salaried) staff, (2) private physicians in separate hospital-based offices, (3) nearby office buildings with private staff along with supporting laboratories and radiologists, (4) full-time (salaried) staff in the hospital-based offices, (5) a health center at a distance from the hospital with salaried staff, and (6) a prepaid group practice (being planned). All these compete for access to hospital beds.

The problems of the traditional hospital outpatient clinics are the education of house officers and the care of the patients. Care is increasingly programatic, organized for (1) emergency care, (2) transient medical problems, (3) diagnostic work-up, but also for (4) maintenance, supervision and support of patients with chronic illness.

At the MGH nurses have participated in care in new ways to improve care of both children and adult patients. Nurse clinicians, nurses with responsibilities of patient care rather than administration, treat patients on a scheduled basis as physicians also do. Once the care and needs of the patient have been outlined by the doctor, such nursing staff direct the therapy and will follow-up the patient at OPD appointments which involve the patient and the nurse only. The nurse clinician, concerned especially with ambulatory medicine, is to be contrasted with the nurse specialist who now works in sub-specialized hospital areas such as cardiac and respiratory care units.

Expansion of new professional arrangements in care also depends on new interest of doctors on care outside the hospital. Students entering medical school express such new interests. A recent comparison of the matriculating class of '73, Harvard Medical School, with its predecessors, the class of '69, showed a decline in the percentage of students aspiring to "full-time faculty or research positions" from 33% to 16% and an increase in the percentage planning on family practice from 3% to 22%. At present high priorities in medicine include community medicine, bio-medical engineering and public health problems.

A cost analysis of clinic care in large hospital OPD reveals administrative costs (without physician fees) to be greater than private care fees. While some of this may be attributed to the costs of education (doctors, nurses, social workers) some of it is due to nursing staff employed in administration of care. Treatment of patients is a more effective use of nursing staff and of these costs.

Anita Hodson, M.D.

Editorials

MONEY TALK

	Total	Medicare Paid	Blues Paid	Patient Paid
Surgeon	$1415.00	$ 974.00	$293.00	$150.00
Internist	270.00	216.00	52.00	2.00
Anesthesia	182.00	145.60	36.40	0.00
Hospital	2299.25	2253.91	44.00	1.34
Nurses	424.00	00.00	318.00	106.00
Misc.	30.00	30.00	00.00	00.00
	$4620.25	$3617.51	$743.40	$259.34

When the federal government buys airplanes or army pants, part of its contracts to purchase include its stipulations of quality: so many rivets per square inch to withstand so many pounds of pressure, so many threads per inch of pants' fabric, etc. No sensible taxpayer would have it otherwise. Is it therefore logical that as the same government assumes an ever-increasing financial responsibility for the purchase of medical care that it will act any differently about asserting its prerogatives of specifying quality, of defining, so to speak, the attributes of the product it is paying for?

Because so few physicians seem to know the details of the costs of medical care other than that part of which represents their own bill to the patient (or to Uncle Sam or Daddy Blue), we thought this meticulous accounting kept by a compulsive former accountant of the total expenditures of his recent illness would be of interest to report. The hospital and the surgeon were not in Delaware; the Blue Cross-Shield policy is the local Over-65 contract.

The government paid directly for about 78% of this patient's expenses. The chief contribution of his Blue insurance was to pay a supplement to his surgeon and to provide 80% of private duty nurses' fees. The patient's uncovered responsibilities were to his surgeon and for part of his nurses; his total personal obligation amounted to about 5% of the total costs, excluding, of course, his annual Medicare and Blue Cross-Shield premiums.

If there had been no private nurses, then the cost of the illness would have been almost 10% less, but the government's portion increased to 85% of the total, and the Blues' role relegated chiefly to paying the surgeon more than the government allowance.

To go back to the rivets and threads-per-square-inch analogy with which we began, it seems inevitable to us that anyone or any institution picking up 85% of the tab is going to be increasingly interested, vocal, and authoritative about that for which it is paying.

B.Z.P.

CEPHALEXIN

Cephalexin* is the second oral cephalosporin antibiotic made available for general use by physicians in the United States. Cephalexin is a superior agent when compared to its predecessor cephaloglycin and, in fact, makes the latter antibiotic obsolete after less than a year of general clinical usage. Cephalexin is a zwitterion which is offered for commercial use as the monohydrate, this being the form which produces higher blood levels and more immediate absorption after oral administration. Cephalexin varies from the other cephalosporin antibiotics by a simple methyl group at the 3 position.

Cephalexin is well absorbed after oral administration with blood levels equivalent to those which follow the parenteral administration of cephalothin. Cephalexin is so completely absorbed from the gastrointestinal tract that minimal amounts of the antibiotic are recovered from the stool, perhaps explaining the low incidence of diarrhea resulting from the administration of this oral agent. Cephalexin has been used for the treatment of a variety of infections over the past few years. The most extensive clinical experience has been in the treatment of urinary tract infections, and this indeed is one of the most valuable uses for this antibiotic. It has been effective in the treatment of patients with acute urinary tract infection, both pyelonephritis and cystitis, as well as the long-term management of patients with chronic or recurrent pyelonephritis. The initial dose in acute urinary tract infection should be 250 to 500 mgm every six hours. In patients in whom long-term suppressive therapy is desired, a dosage of 250 mgm may be given twice daily. As with other cephalosporin antibiotics, emergence of strains of *Pseudomonas* occasionally complicates cephalexin therapy.

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* Keflex® (Eli Lilly and Company)

Upper and lower respiratory infections have been satisfactorily treated with cephalexin, and this new antibiotic eradicates group A streptococci from the throat of patients as effectively as does penicillin. However, it has not yet been established that cephalexin is as effective as penicillin in preventing rheumatic fever and glomerulonephritis. A controlled clinical study designed to establish the efficacy of cephalexin in the prevention of the sequelae of streptococcal infections is underway at the Wilmington Medical Center at the present time. Cephalexin is an effective oral antibiotic in the treatment of pneumonia in children and adults, particularly pneumococcal pneumonia. It is important for the pediatrician to note that cephalexin is not recommended for the treatment of infections due to *Haemophilus influenzae.* Therefore, in clinical situations where infection with this microorganism is a possibility, cephalexin should not be considered a possible alternate for antibiotic therapy. Cephalexin has been successfully used in the treatment of soft tissue and wound infections and also has had satisfactory, though more limited, use in the treatment of osteomyelitis.

Since cephaloridine has proved to be an effective "single-dose" agent for the treatment of gonorrhea,[1] it was hoped that cephalexin would prove to be an effective oral medication by the one-dose technique in the treatment of this infection. Studies in volunteers reported by Taylor and co-workers[2] showed good blood and urine levels after the administration of a single three gram oral dose of cephalexin, alone and in combination with probenecid. Unfortunately, cephalexin has been disappointing in the treatment of gonorrhea with approximately 30% of the patients failing to achieve clinical and bacteriologic cure on a single three gram dose with only a slight improvement in the results when this dose is enhanced by one gram of probenecid. In the studies carried out by Taylor, the probenecid and cephalexin were administered simultaneously. It is possible that the administration of the probenecid approximately two hours before the cephalexin would prolong the blood levels of the antibiotic and improve the clinical results. However, in the clinic setting, where most of the patients with gonorrhea are treated, such timing of doses of medication is not practical.

In local studies carried out by Hogan[3] and Taylor[2], the incidence of cephalexin side effects was extremely low. Likewise most of the reports in the literature indicate that this antibiotic is well tolerated. Brumfitt[4] has been disturbed by the high incidence of vulvavaginitis seen complicating therapy wth cephalexin in patients treated in the United Kingdom. One possible explanation is that most of Brumfitt's patients who developed vulvavaginitis were young pregnant females, and to date the use of cephalexin in pregnant women in this country has probably been extremely limited.

In summary, it should be stated that cephalexin is an effective, well-tolerated oral cephalosporin antibiotic, and its release represents a major advancement in the treatment of bacterial infections.

W. J. H.

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BLUE SHIELD'S PARTNERSHIP WITH MEDICINE?*

The March issue of the *Delaware Medical Journal* published a presentation by George Dunlop, M.D., at the annual meeting of the Medical Society of Delaware, entitled "Blue Shield's Partnership with Medicine."

The article reviews some of the history of prepayment and discusses some of the forces of change which have required adaptation and innovation on the part of both Blue Shield and physicians. The article's thrust is that, in the face of continuing pressure toward change, neither Blue Shield nor the medical profession can survive alone without the other. Therefore physicians are not properly fulfilling their commitment to public need unless they allow Blue Shield everywhere to sell "full-fee programs" to replace indemnity programs. If the public doesn't get paid-in-full programs this way, they'll get them through other intermediaries or direct from government, usually by some form of capitation group practice arrangement. The socio-economic problems of health care are so complicated that physicians would do well to concentrate on treating their patients and let their partner, Blue Shield, do all the worrying and make the decisions necessary about health care delivery and financing.

The above is a partial summary of Dr. Dunlop's remarks. What follows is an analysis of some of the statements made to support the conclusions drawn, and a discussion of some alternative ideas which could emanate from such an analysis.

In the first few paragraphs Dr. Dunlop says, "Most doctors would just like to be left alone and given time to take care of their own patients, to keep up with the literature, and perhaps to do some teaching and research. Their life is so busy, useful and rewarding that even the demands of family life are hard to meet, much less the social and economic problems that beset the profession on every side." And in the concluding paragraph he says, "In medical judgments doctors have been schooled for generations, but in medical economic judgments their background has been limited by preoccupation with the sick. Blue Shield with its ear to the ground can tell what the public is saying, and we need to heed that voice."

There is no doubt that physicians would prefer to spend their time practicing medicine. But in the words of Dr. Dunlop, "The tide of events has permanently interjected a third party between the physician and the patient . . ." Does this mean that the physician should then let others determine the climate in which he meets with his patient? In a recent debate on the subject of compulsory national health insurance a labor leader also expressed the thought that while no one but a physician can properly deal with a patient's medical ills, physicians are not capable of making judgments about government, economic, and social issues. Therefore physicians, he said, should let others make all the decisions about health care delivery and financing. Remarks in rebuttal to this thesis stated that the physician is more apt to come up with proper judgments on matters of government and economics in the health care field, by virtue of his training and background, of his involvement in community and organizational affairs, of his place as head of a family, and of his knowledge of the business of medical practice, than is a politician or a labor leader. Is it possible that this could also be true in relation to Blue Shield? In the first instance we have politicians and labor leaders lulling us into a mood of acquiescence in order to get their oar into the health care field through such a proposal as the Kennedy-Griffiths Labor Health Security Act, and in the second instance we have Blue Shield, struggling for survival, telling us to let them do our economic planning for us. Is there really a difference?

This writer firmly supports our private health insurance industry; its survival should be the concern of every physician. But the function of an insurer should be that of an underwriter and risk taker, not a fiscal agent of a financing source such as government. Dr. Dunlop says, "Blue Shield speaks with an unbiased voice in its dealings with management, labor and government," and in another area says, "Blue Shield has the responsibility of representing the physician or the provider of medical care, and seeing that their interests are equally well represented." Most of us know that as carrier for Medicare and fiscal agent for Medicaid, Blue Shield has become an agent of the government and automatically carries out the directives sent to it from the financing source, for to do otherwise would be to court loss of a substantial part of the total business. It is ridiculous to state that in government health care programs "Blue Shield speaks with an unbiased voice . . . "

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*See Delaware Medical Journal, March 1971, 68.

In the nongovernmental area where an underwriting function still exists, there is much less chance for bias to predominate. But here let us see what really has happened. The purpose of insurance is to prepay a possible future loss. In the case of health insurance as well as fire, accident, auto insurance, etc., the subscriber is indemnified for a portion of the loss if it occurs. The arrangement, in short, is primarily one between the victim (the patient) and the insurer. With the advent of the practice of direct payment to the physician by Blue Shield, that organization became as much a collecting agent for physicians as a prepayment mechanism for clients. There are those who feel that this was a mistake, for it tended to make the physician too much interested in the sure dollar collected on his behalf and the patient completely isolated from any financial responsibility in his patient-doctor encounter. As national accounts were negotiated with labor and management, more and more pressure was applied toward paid-in-full plans, and Blue Shield has in general acquiesced to this approach on the assumption that it was a response to a public need. It could do this in competition with commercial health insurance companies only because of the "participating physician" concept in which physicians agree to abide by certain imposed fee ceilings in return for the certainty of receiving dollars reasonably near the fee they might have charged anyway. These thoughts reach their zenith in the currently proliferating one hundred per cent payment contracts under the prevailing fee concept.

Certain questions now need answers. Is Blue Shield, the so-called "doctors' plan," really still the doctors' plan, and if it is, in this era of consumer involvement, should it be?

If physicians are members of Blue Shield boards, should they be there as knowledgeable citizens and consumers, or as representatives of their Medical Society? Why should there be any negotiations between a physician and Blue Shield except as a client, for his own insurance? Would everybody be better off if all health insurance were a reimbursement to the patient, and not a guaranteed amount to be paid to the doctor?

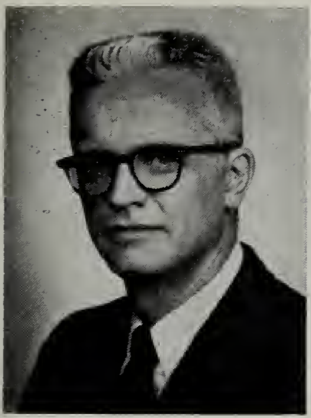
What is responsible medical statesmanship? Is it responsible to bend to change brought forth by so-called "public demand," even though values are at stake, such as individual responsibility, individual cost sharing, built-in utilization controls, and ingredients of both physician and patient character? Or would it be more responsible to advocate 1) that while prepayment by the insurance principle should be encouraged in the health care field, such arrangements are the business of the individual, and the physician should care less where the patient gets his money to pay him, 2) that such a responsible relationship between patient and physician would result in less utilization, reduced health care costs, greater patient understanding and less physician concern with payment, and 3) that the illusion that Blue Shield is the "doctors' plan" should be terminated by the removal of Medical Society representatives from the Blue Shield Board?

It is indeed timely to discuss "Blue Shield's Partnership with Medicine," for we must find the answers to these and other related questions.

William O. LaMotte, Jr., M.D.

If the appropriate sanitation services are not provided, the counterpart of increasing opulence will be deepening filth.

John Galbraith



President's Page

NO RMP FOR DELAWARE?

Recently a group of medically oriented people met with the HEW representatives in an effort to develop a health care delivery system for the State of Delaware, with direct reporting to HEW as is now established for regional areas.

The Greater Delaware Valley Regional Medical Program was originally introduced to us as a geographic device to be used in improving health care delivery in Delaware. One early feature that raised eyebrows was the inclusion of two Delaware counties without the third. This was soon rectified. Then it became apparent that a sovereign state had been combined with the southeastern counties of Pennsylvania and the counties of southern New Jersey, as far as medical activities were concerned.

At its inception the Greater Delaware Valley Regional Medical Program entered into a liaison with Philadelphia's six medical schools. Naturally this liaison has added greatly to the administrative costs of the program.

We maintain that the creation of regions where three sets of state laws have to be satisfied, only impedes progress, and amasses weighty administrative forces. In Delaware we have almost immediate contact with our Governor and our General Assembly, which enables us to be quick and responsive in securing aid from our State government. None of the other members of the now existing Delaware Valley Regional Medical Program can match this. In truth Delaware is ideal for a pilot study in any field of federal government inquiry, be it medicine, economics, law or social services. We have an easy relationship with our State government, and a cross section of human forces from the ghettoes to the farms, from the metropolitan areas to the hamlets, from the very wealthy to the impoverished and even from the very vocal to the silent majority.

Delaware Medicine can offer itself as the testing ground for the remainder of the United States when it is once more free to act through the sovereignty of its State and not through a regional medical program.

Rhodyn J Bishoff

CONCERN

During the period 1959-1967 while I was in the active practice of clinical medicine, I felt that no one could be closer to, and more understanding of, all those individuals I treated than I was. Equally strong was my belief then that in my private practice as well as at the Delaware Hospital Emergency Service or in the obligatory clinic services I attended, I always took enough time with and was extremely considerate of all the patients I saw in any of these areas.

In the period 1967 to 1971 as the full time Director of Ambulatory Services for the Wilmington Medical Center, I have been deeply involved in the Medical Center's participation in community outreach programs. At the same time I have had the opportunity to place myself on the other side of the mirror and to see my physician colleagues, as I had been, from a different point of view. Though this article is on the page sponsored by the Family Practitioner and though Family Practice was my specialty, this "concern" is directed to *all* physicians.

I believe I have at present a much deeper understanding of the social and economic factors of medicine, an understanding not easily obtainable as a solo practitioner. In my present role I have dealt closely with individuals from all walks of life, from all social and economic brackets and of all races, creeds, and religions. It is my belief that I have reached a better understanding and rapport with these different segments of our Greater Wilmington Community and am more knowledgeable at present of their many different points of view. Hopefully, I have gained the confidence of the individuals expressing these many points of view. Though many are contradictory, I have a deeper understanding of why conflicts and contradictions exist.

The presentation of this personal background relates to the following event. I recently received from a well-educated, professional and highly respected member of a minority group, a communication in which it was stated that if the Wilmington Medical Center, or if indeed William H. Duncan, M.D., expected to see any changes in his lifetime, consideration should be given to educating and instructing physicians, particularly in attitude and sensitivity, as soon as possible because each day that went by where this was not done extended by some multiple the day in which the controversy surrounding the delivery of health services could be resolved. The following quotation represents the feelings of this individual whose home is Delaware. He received all medical care throughout infancy, childhood and early adulthood from clinics in the Wilmington area. He received all the education necessary to become a health worker in Delaware, except for some segments of his professional education. He is known to many of us but shall remain anonymous for the purposes of this article. Recognition of the basic fact that the outpatient services of the Wilmington Medical Center are designed primarily for the care of indigents will place many of these remarks in perspective.

"Treatment being received in the Wilmington Medical Center is everything except desirable. The inhibiting factor is not a unique one, but that of a selfish and negative attitude on the part of the physicians and most particularly the fact that they are passing this on to those physicians under their supervision in training.

"The physician who wants to change the quality of care now offered, must change in his own body and soul. He can accomplish this by becoming better acquainted with his own mental and physical capabilities and the acknowledgment that certain prejudices do or do not exist. Technically he is aware of what he can do and what is required of him, and he agrees almost always as human beings do, to participate. But as time goes on, the pressures of the day are used as a rationalization to allow in the hospital setting, particularly the outpatient department, haphazard medicine that he would not consider practicing in his private office. It appears that the physician does not take his obligation or his commitment seriously.

"Though it may not be said, it is certainly felt by the patients that the physician feels superior because of his education and his specialty. This omnipotent air must also be looked at introspectively by each physician. Each patient that is seen should be treated as if he or she is a private patient in the physician's office. The clinic environment cannot be given as an excuse for not respecting the patient in the same manner in which the physician would want to be treated himself or not giving the same treatment he gives in his private office.

"There is a simple fact that has been proven over and over again: the great majority of people on 'charity' are not in that status by design. The fact that someone is on 'charity' must not influence health workers to allow a frustrating visit in which an individual has treatment in a hurried or disrespectful manner. The feelings of respect, pride, and trust are felt by the poor as well as the rich and are just a few of the human elements which keep the total of any community active and in meaningful productivity. The lack of any of these can cause mistrust and unrest which will mirror itself even outside the health delivery field. Therefore, in spite of the miraculous steps of medicine, such as heart transplants, the single physician in his personal dealings with a patient can destroy the performance of all today's miracles, if he does not preferentially do everything in his power to strengthen interpersonal relations with all patients.

"Ancillary health professionals must also re-evaluate their viewpoints. The usual hospital routine, which is at best dehumanizing, usually strips the dignity from an individual and at the same time removes the individual's good will, thereby generating a poor public image. This also is a basic display of a superior attitude.

"The very smallest of courtesies, as well as interpersonal relationships, are what are needed first to improve health care. These are the simple facts of being on time, complying with the obligation, not quarreling about whether or not a medical record is available, or if there is one more than a certain number of patients registered. Only one individual suffers from such arrogance and unconcern, the patient.

"Everyone recognizes the physician as a specialist in a particular field of human endeavor and service, and all are willing to provide to a person so trained, a professional respect, but such respect must likewise be provided to those who are being treated.

"The newspapers, other news media, and everyone you talk to, are stating dollars are the answer to health delivery. Dollars would be less of an answer and less of a need if the appropriate attitude and desire for delivery of service could be improved."

The above I know was heartfelt and sincere. My obligation is to bring this message to all of my colleagues; your obligation is to evaluate your own standing with your fellow man.

William H. Duncan, M.D.

* * *

I would say there isn't a critical shortage of nurses but more a shortage of nursing. Nurses are often engaged in such non-nursing jobs as desk work and filling out records. I realize all these tasks are important, but I think we need to look at who is doing what. . . . The jobs could well be done by a person who has no nurse's training at all.

Mary Gertrude Healy, Director of the Nursing School of Wilmington

In Brief

Speakers on "Ask the Doctor"

Speakers for May 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: May 4, Patrick T. Hart, M.D., *Contact Lenses;* May 11, Jerome Kay, M.D., *Depression;* May 18, William H. Duncan, M.D., *Community Outreach Programs for the Wilmington Medical Center;* May 25, Dewey A. Nelson, M.D., *Multiple Sclerosis.*

In the News

Marjorie J. McKusick, M.D. was elected Treasurer and will serve on the Executive Council of the Society for Adolescent Medicine for the coming year.

Ali Z. Hameli, M.D. has been reelected Secretary-Treasurer of the National Association of Medical Examiners.

MSD Annual Meeting

The Annual Meeting of the Medical Society of Delaware will be held at Dover Downs in Dover on October 9, 1971. An exciting line-up of speakers is being arranged. Mark your calendars now to reserve this date for an interesting and enjoyable session. The day will conclude with a banquet and Dixieland jazz dancing.

Scientific Exhibits

See page 120 for an application blank for the Scientific Exhibits for the Annual Meeting in October.

Weymouth Foundation Lectures

The Department of Pediatrics of the Wilmington Medical Center announces the First Weymouth Foundation Lectures, *Current Approaches to Some Problems in the Newborn.* These will be given May 14, 2-5 p.m. at the Delaware Academy of Medicine. The lectures are open to physicians and nurses.

Diabetic Children's Camp

Delaware children are eligible to attend the Pennsylvania Camp for Diabetic Children, owned and operated by the Delaware Valley Diabetes Association in Spring Mount, Pa. For further information, call the Delaware Diabetes Association, 656-0030.

AAP Policy Statement

The American Academy of Pediatrics, in a policy statement entitled *Guidelines for Child Health Care* (Feb.1-Newsletter), emphasized that primary attention should be given to the development of a national health plan for children "because improving the health of children and youth is a corridor to better health for the entire population." Priorities emphasized are: antenatal care, postnatal care, health care for 1-5 years, and health care of school children and adolescents.

1971 Rorer Awards Contest

The American College of Gastroenterology, in cooperation with William H. Rorer, Inc., announces the 1971 Rorer Awards Contest for the best papers in Gastroenterology. There will be two classes of awards. *For the Best Unpublished Papers in Gastroenterology or an Allied Subject,* first prize, $500, second prize, $300, and third prize, $200. These papers must represent original work in gastroenterology or an allied subject and must not have been previously presented at meetings of any National Society. The recipients of the first two prizes will be given the opportunity of presenting their papers in person at the Annual Meeting of the College in October of 1971. *For the Best Paper Published in The American Journal of Gastroenterology,* first prize, $500, second prize, $300, and third prize, $200. These prizes are to be awarded for the best papers published in *The American Journal of Gastroenterology* during the 12 months ending June 30, 1971, for which no previous prize has been awarded. All entries must be received no later than July 15, 1971. For further information write to the Research and Education Committee, American College of Gastroenterology, 299 Broadway, New York, N.Y., 10007.

Methadone Maintenance

A statement, issued jointly by the Committee on Alcoholism and Drug Dependence of the AMA and the Committee on Problems of Drug Dependence of the National Research Council, emphasizes that methadone maintenance is not feasible in the office practice of private physicians. It defines, in general terms, the requirements of "proper medical practice" in relation to methadone treatments.

The individual physician cannot provide all of the services for the various therapeutic needs of the patient. The individual physician also is not in a position to assure control against redistribution of the drug into illicit channels, to maintain control of doses, or to establish the elements for proper evaluation of the treatment. Practicing physicians, however, should cooperate with methadone maintenance programs in their communities and offer whatever services they may be capable of providing.

Experimental Ureteral Valve

Dr. Frederick Costello, University of Delaware College of Engineering, and Edwin Karvois, a senior, have together designed a Teflon ureteral valve to prevent ureteral reflux. Designed to flex some 136,656,000 times during a normal lifetime, the first *in vivo* use of the Costello-Karvois valve took place last month, as an experimental implant into dog's ureters.

Workshop Symposium

A national workshop symposium to develop an emergency medical care services plan will be held May 6 and 7 at the Bellevue Stratford Hotel in Philadelphia under the auspices of the Delaware Valley Council and cooperating city, state and federal agencies. Representatives of industry, health, civic, service and other groups from cities throughout the nation will attend the conference. For further information call: J. W. Frey, 1-215 LO3-7835.

CLINICAL NOTICES AND MEETINGS

Medical-Legal Conference

The American College of Legal Medicine will sponsor a conference on *Medical Malpractice, Drug Problems and Legal Aspects of Community Health Programs,* May 7-9, 1971, at the Royal Orleans Hotel, New Orleans. Those interested should send their names and addresses to the American College of Legal Medicine, 1340 North Astor Street, Suite 1201, Chicago, Illinois, 60610 to be placed on the mailing list.

Breast Cancer Conference

The Second National Conference on Breast Cancer, sponsored by the American Cancer Society, will be held at the Century Plaza Hotel, Los Angeles, California, May 17-19, 1971. For further information write: Esther Kelley, Professional Education, American Cancer Society, Inc., 219 East 42nd Street, New York, 10017.

Symposium on the Infant

A Symposium on *The Infant at Risk: Early Detection and Preventive Intervention,* will be held May 26-29, at the Jack Tar Hotel, San Francisco. For information write: Mr. Robert E. Trefry, Executive Director, San Francisco Chapter, National Foundation-March of Dimes, 111 Sutter Street, Room 819, San Francisco, Calif., 94104.

Maryland Medical and Chirurgical Faculty

The 173rd Annual Meeting of the Medical and Chirurgical Faculty of Maryland is scheduled for May 12-14 at the Baltimore Civic Center. The scientific portion will include many prominent lecturers and pediatric medical and surgical grand rounds. There is no registration fee and credit will be given by the Academy of General Practice for attendance. For further information write: Medical and Chirurgical Faculty of the State of Maryland, 1211 Cathedral Street, Baltimore, 21201.

ACP Courses

The American College of Physicians announces the following courses: *Immunologic Concepts of Hypersensitivity in Man,* May 19-21, to be held at the State University of New York, Buffalo, New York; *Clinical Auscultation of the Heart,* May 19-21 to be held at Georgetown University Hospital, Washington, D.C.; and *Clinical Endocrinology: Physiological Basis for Current Diagnostic and Therapeutic Procedures,* May 24-28, University of Michigan Medical Center, Ann Arbor, Michigan. For further information write: Edward C. Rosenow, Jr., M.D., Executive Director, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104

Wisconsin Heart Association

An Appraisal of Coronary Surgery 1971 will be presented at the Annual Scientific Session of the Wisconsin Heart Association, May 24-26 at the Milwaukee Expo and Red Carpet Inn, Milwaukee. Write: Miss Lynne Kellaway, Wisconsin Heart Association, 205 West Highland Avenue, Milwaukee, Wisconsin, 53233.

Hospital Patient Safety

The Professional Liability Committees of the American Hospital Association and the AMA will present *A National Conference on Patient Safety in the Hospital,* May 13-15, 1971, at the Palmer House Hotel, Chicago, Illinois.

Anesthesia Degree

Mount Marty College, Yankton, South Dakota, will be the first college in the nation to offer degrees in Anesthesia. College students and registered nurses across the country will have a first opportunity to study for a bachelor's degree with a major in anesthesia. Another bachelor's degree program in *Inhalation Therapy* is also offered. Mount Marty College, a private, coeducational, Benedictine institution founded in 1936, presently supports an NLN-accredited baccalaureate program in Nursing, and a nationally-accredited degree program in Medical Technology.

AHA Medical Program

The American Heart Association Scientific Council will present *Hypertensive Mechanisms and Their Control* at the Cleveland Clinic, May 24-26, 1971.

Diving Medicine Course

The National Association of Underwater Instructors will hold its first Diving Medicine Course for Physicians May 1-8, 1971, at the Underwater Explorers Club in Freeport, Grand Bahama. The course will include diving physics, venomous marine animals, diving physiology, advances in diving equipment, shallow water blackout and drowning, decompression sickness, pulmonary physiology, decompressure chamber operation, physical exams for divers, air embolism, treatment table and other related subjects. For those doctors who have no diving experience, an additional course in *Basic Skin and Scuba Diving* will be available. For more information or a schedule of other 1971-1972 Medical Programs, write NAUI Headquarters, 22809 Barton Road, Colton, Calif., 92324.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

PEDIATRICIAN: Graduate Far Eastern University, Philippines. ECFMG Graduate. American internship and residencies. Delaware licensed. Available July 1971.

OPHTHALMOLOGIST: Interested in Delaware practice. Board eligible as of February 1972. Available March 1972.

THE FORUM

Environment And Health

THE PHYSICIAN AND AIR POLLUTION: I

Arthur R. VandePoele

The arena within which the physician can play his proper role in dealing with air pollution is worldwide — experience with strontium 90 and the possible "greenhouse effect" from the increasing concentration of carbon dioxide in the atmosphere demonstrate the globe-girdling effects of air pollution —, but the physician's most immediate concern is always with his patient.

When an air pollution episode strikes his community, there are specific steps the physician can take to protect his patients, especially those with conditions which experience has shown may be aggravated by reduced air quality.

During a five-day episode in Donora, Pa., in 1948, 20 people died when only one or two deaths would normally have been expected, and 40 percent of the population (nearly 6,000 people) developed symptoms of illness during the first day of the smog. The London smog of 1952 is credited with 4,000 deaths. In both cases, it was clear that certain groups of people were more susceptible than others to the effects of acute air pollution.

In Donora, for example, illness struck 60 percent of those over 65, 79 percent of the chronic bronchitics and 88 percent of the asthmatics — as compared with only 43 percent of the total population who became ill during the episode. All of those hospitalized and 80 percent of those who died had previously suffered from pulmonary or cardiac disease. In London the death rate from bronchitis went up by 638 percent and pneumonia deaths rose by 300 percent.

More recently, a study in Buffalo, N. Y., found that the number of children hospitalized for asthma attacks rose sharply as air pollution levels rose. In periods of low pollution, an annual average of 32.4 children per 100,000 were hospitalized for asthma; at the highest pollution levels, the number jumped to 50.7 per 100,000. Hospitalization of children for eczema jumped even more sharply, from 2.9 per 100,000 to 10.2. Other studies have suggested increased risks for premature and newborn infants during air pollution episodes.

The old; the very young; those with asthma, bronchitis or emphysema; and those with cardiac disease, especially coronary artery disease — these are the likeliest victims of acute air pollution, the patients who need the physician's closest attention when an air pollution episode strikes his community.

Continued next month

Mr. VandePoele is Executive Director, Delaware Tuberculosis and Health Society.

This page is sponsored by the Delaware Tuberculosis and Health Society.

Win, Place and Show

182nd ANNUAL MEETING, MEDICAL SOCIETY OF DELAWARE

Applications for SCIENTIFIC EXHIBITS for the Annual Meeting of the Medical Society of Delaware are invited by the Scientific Exhibits Committee.

It is hoped the exhibit portion of the Annual Meeting to be held at DOVER DOWNS IN DOVER, OCTOBER 9, 1971, will be the stimulation to demonstrate scientific achievement of members, interns and residents. Allied health personnel are also to be encouraged in their medical pursuits.

Professional assistance is available in graphic arts, booth construction, and photo reproduction through the following:

1. Opportunity Center
2. Photo Art Inc.
3. Allied Arts and Exhibits, Inc.
4. Mr. Hugh Roberts, Consultant — 652-1181

Mail APPLICATION to the Medical Society of Delaware, 1925 Lovering Avenue, Wilmington, Delaware 19806.

SCIENTIFIC EXHIBITS
APPLICATION FOR SPACE

182nd Annual Meeting, Medical Society of Delaware

Dover Downs, Dover, Delaware

October 9, 1971

1. Title of Exhibit: ______________________________
2. Name(s) of Exhibitor(s): ______________________ Degree: ______
   Institution or Organization (if desired): ______________________
   City ______________________ State ________ Tel. No. ________
3. Exhibit is Free-standing, Self-contained ______________________
4. Size of Booth Requested: (Absolute Maximum: Length 10′, Depth 6′). ____________
5. Description of Exhibit: (Attach a brief description telling the purpose of the exhibit, what the exhibit shows, and the conclusions reached.)
6. Photograph or sketch of exhibit should accompany this application.

Deadline for Filing Applications, May 15, 1971.

Delaware
Medical Journal

MAY, 1971
VOLUME 43
NUMBER 5

RECENT ADVANCES IN TUMOR IMMUNOLOGY (A Review)

• Is cancer a disease of immune mechanisms?

Irwin L. Stoloff, M.D.

The number of animal experiments reported in recent years testifies to the interest in the role of tumor immunity in man. The role of tumor immunity in man will be discussed as follows: (1) tumor antigenicity; (2) immunologic surveillance; (3) non-immune defenses.

Tumor Antigenicity

While spontaneous tumors in general are less antigenic, a large number of experimental tumors in animals show tumor antigenicity, sometimes specific to the individual tumor and sometimes specific for the tumor type, depending on the mode of induction of the tumor. In general, chemically induced tumors have individually specific antigens, and viral induced tumors tend to have group specific antigens. Tumor antigens have been found on the cell surface and within the tumor cell. The current thinking is that the surface antigens are more important. Because they are more readily reached with specific antibody, they are more easily identifiable and thus provide greater hopes for immunotherapy. Surface antigens may be associated with the following phenomena: a) the relatively negative charge reported on the surface of most cancer cells; b) a loss of contact inhibition in the cancer cells; c) the ease of cloning of cancer cells; d) the relative ease of tumor growth in tissue culture; and e) the inverse relationship between the presence of tumor specific surface antigen and histocompatibility antigens. While tumor specific antigens tend to occur in artificially induced tumors, the frequency of tumor antigens in the naturally occurring tumors of man is unknown at present.

Of interest is the recently posed question: are tumor specific antigens really new antigens or merely buried and hence difficult to detect in normal cells? Some evidence has been developed to demonstrate that at least in humans the tumor specific antigen known as carcino embryonic antigen (CEA) is found also in fetal gut cells. Other bits of evidence suggest that the use of certain enzymes such as trypsin can be used to uncover antigens previously buried in normal cells. It is not yet clear if normal adult cells contain buried tumor-like antigens.

Tumor specific antigens so far demonstrated in man have been found in the following diseases: Burkitt's lymphoma, colon cancer (CEA), melanoma, osteosarcoma, and chorion carcinoma.

Dr. Stoloff is Associate Professor of Preventive Medicine and Medicine, Jefferson Medical College, Philadelphia, Pa.

This paper was originally presented at the Kent General Hospital as part of the Continuing Medical Education Seminars for Physicians, sponsored by the Delaware Institute of Medical Education and Research and the Medical Society of Delaware, January 26, 1971.

In patients with Burkitt's lymphoma at least two serum antibodies have been found for surface antigens on Burkitt's lymphoma cells. These are the EB virus antibody, which reacts with EB viruses cultured from tumor cells, and a second type of antibody detected by immunofluorescence which reacts with the lymphoma cell surface.[1,2] It isn't clear at the moment whether this tumor specific antigen is viral in origin, represents a new protein produced by the cell, or is an uncovered determinant on the cell surface in some way caused by the virus. A similar cell surface antigen has been found in patients in the USA with nasopharyngeal carcinoma.

A case for tumor specific colon cancer antigen has been proposed by Gold et al.[3] Gold found surface antigen in primary colon and rectal cancers and also in some cancers arising in other sites in the gastrointestinal tract. The similarity to cell surface antigens from fetal gut cells in the first two trimesters of pregnancy has been demonstrated, and in addition antibody to this antigen has been found in approximately 50% of the patients with colon cancer and in women without cancer who are in the first two trimesters of pregnancy.

Two antibodies have been found in melanoma patients including one to a cell surface antigen detected by immunofluorescence. A similar phenomenon has been described by Morton for osteogenic sarcoma.[4] A large proportion of cells grown from osteogenic sarcoma patients have an identical surface antigen which reacts with sera from patients with this disease, and a relationship between the antibody level in patients with osteogenic sarcoma and their survival has been suggested by Morton. It has been suggested that this tumor specific antigen is in some way related to viruses, since close contacts of patients with osteogenic sarcoma possess a similar antibody in their serum, and tissue culture of osteogenic sarcoma yields a virus-like particle.

In chorion carcinoma, an association has been recently described between the patient's survival and the ability of women with this disease to retain skin grafts from their husbands for longer periods of time. The suggestion is that the chorion carcinoma acts like a foreign tissue transplant and that females with the disease are more tolerant to the histocompatibility antigens of their husbands. Attempts have been made to immunize such women with male tissue with promising results.

These sporadic reports of tumor specific antigens in man at the moment are most promising from the point of view of early detection of such tumors. If tests can be devised which are sensitive enough to detect these antigens at a stage where the disease is still curable, our fondest hopes will be fulfilled.

Immunologic Surveillance

The question of immunologic surveillance has been raised in part to explain why more people do not die of cancer, if the biologic concept that neoplastic transformation is continuously occurring in the human population is correct. In this hypothesis, the immune system has been given the central protective role to destroy such neoplastic mutations.

There are several observations in man supporting the importance of immunologic surveillance.

A relatively high proportion of patients with immunologic deficiency diseases have neoplasms. There is a higher frequency of neoplasms in those receiving immuno-suppressive agents and/or tissue transplants. Cellular and humoral cytotoxic antibodies to autochthonous tumors have been reported in certain patients cured of their cancer. There are preliminary observations of the effect of BCG and other stimulants to the immune system in protecting against neoplastic disease. A few instances of successful immunotherapy of cancer have been reported.

A register of neoplasms in people with immunologic deficiency diseases and in those receiving tissue transplants and immunosuppressant therapy has been developed. This registry currently seems to indicate that lymphomas are more frequent in such individuals, but occasional carcinomas have also been reported. In rare instances a transplantable carcinoma unwittingly included in the graft has been brought under control by stopping immune suppressive therapy.

The Helstroms have succeeded in demonstrating cellular and humoral cytotoxic effects against autochthonous tumors in patients.[5] They also report a relationship between the presence of cytotoxic cells, humoral factors and survival.

A blocking type of antibody which prevents cytotoxic factors from destroying tumor cells has been reported and may explain some current therapeutic failures. We now need to learn with what frequency tumor specific antigens appear and with what frequency cytotoxic and blocking antibody appears in humans with cancer. We also must learn how to control blocking antibody and to stimulate the cytotoxic response to improve survival and, finally, we must develop a capacity to measure the effect of current therapy for cancer on both the cellular and humoral factors.

Reports on the success of inoculating BCG into superficial tumor implants in man have been surprising. In a related observation H. Rapp recently reported success in the use of BCG in preventing spread of transplanted (chemically induced) guinea pig hepatoma.[5] There is also an unconfirmed report that a group of Canadian children receiving BCG in childhood have a lower incidence of leukemia and lymphoma. All of these observations could be related to the well known capacity of BCG to stimulate cellular immunity and to raise the levels of humoral antibody in experimental animals and man.

There are sporadic case reports which claim success with immunotherapy.

Nonimmune Defenses Against Tumor

In animal leukemia, humoral antisera is capable of destroying a maximum of about 100,000 tumor cells. When this number of cells is exceeded in transplant experiments, the tumor succeeds in killing the host. In addition the "sneaking through" phenomenon observed by some suggests that even very low doses of tumor cells may escape destruction by humoral factors. Because of these weaknesses of immune factors in destroying tumor cells in animal experiments, a school of thought has emerged in support of nonimmune factors as important in protection against neoplastic transformation.

The known constituents of the nonimmune defense system are macrophages and lysozymes in certain cells. A central role for the macrophage in protecting against bacterial infection is now well known. The combination of sensitized lymphocytes and specific antigen to produce a migratory inhibitory factor (MIF) which attracts macrophages which in turn engulf and destroy antigens has been proposed to be effective in neoplasia. MIF appears to be nonspecific so that MIF produced by any antigen lymphocyte interaction will immobilize macrophages. Since macrophages have the capacity to invade solid tumors and migrate in tissue spaces, they conceivably could play a major role in tumor cell destruction throughout the body.

Klein's work on treatment of superficial tumors of the skin with 5 fluorouracil or a chemical sensitizer (DNCB) suggests that macrophages play a role in human cancers.[6] Other stimuli of macrophages such as BCG, RNA (Poly IC), endotoxins, and heated smallpox vaccine are currently under investigation. Rapp speculates that it may be possible to inject MIF into superficial human tumors in sufficient quantities to result in tumor destruction similar to his observations on the effect of MIF in guinea pig hepatoma described above. The role of MIF in disseminated visceral cancer is unclear.

Because of the kinetics of immune cell destruction, immunotherapy is theoretically capable of destroying the last tumor cell in contrast to chemotherapy and radiotherapy. A combined approach may be of even greater value in human neoplasia. Combinations such as 1) surgery and immunotherapy, 2) immunotherapy and chemotherapy combined in such a way as to raise cytotoxic response and suppress blocking antibody, 3) immunotherapy plus nonspecific activation of macrophages, all deserve consideration.

Summary

In summary, two promising leads have emerged from tumor immunology which spark the imagination and which may provide some help in the field of human oncology: 1) the early detection of tumors by using immunologic approaches, and 2) the role of immunotherapy in the treatment of cancer.

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Highlights

SICKLE CELL DISEASE

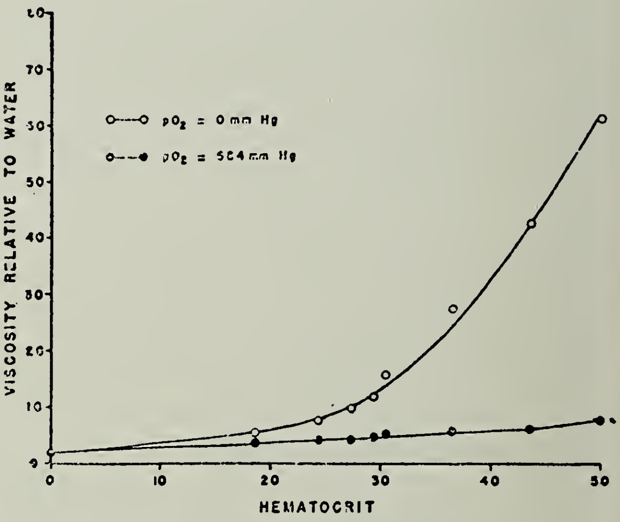
Thomas G. Gabuzda, M.D., *Associate Professor of Medicine, Jefferson Medical College; Associate Member of the Cardeza Foundation; Head, Department of Hematology, Lankenau Hospital; Presented to the Medical Conference, WMC, October 6, 1970.*

Sickle cell anemia, a disabling disease which carries with it a marked decrease in life expectancy, occurs once in every 500 Negro births. There is a great necessity for education among the people apt to be affected by it, since fewer than three of ten adult Negroes seem to have heard of it. It is a much more prevalent disease among Negroes than diseases with high public awareness such as cystic fibrosis and phenylketonuria, and in large city populations has approximately double the incidence of cystic fibrosis and nine times the incidence of PKU. It is therefore a disease of high community importance and is among the neglected public health problems in the nation today.

Editorial comments appear on page 140

Since one in 12 Negroes has the sickle cell trait, the chance of a mating which may lead to sickle cell anemia among the offspring is 1/144. Thus 1/144 equals 0.7% of all Negro families at risk for offspring with the disease since both parents have the trait.

Figure 1



Viscosity-Hematocrit-PO_2 Relationships.

The hemolysis in sickle cell anemia has been attributed to trapping of the deformed red cells in the microcirculation and to premature fragmentation of their distorted membranes. Sickling of affected cells *in vivo* is reversible for most cells but irreversible for a few. In the ordinary peripheral smear of the patient with sickle cell anemia, sickle cells are usually visible and vary from a few in number to 30% of the total cells. Sickle cell preparation with metabisulfite will cause almost all affected cells to assume a sickle shape.

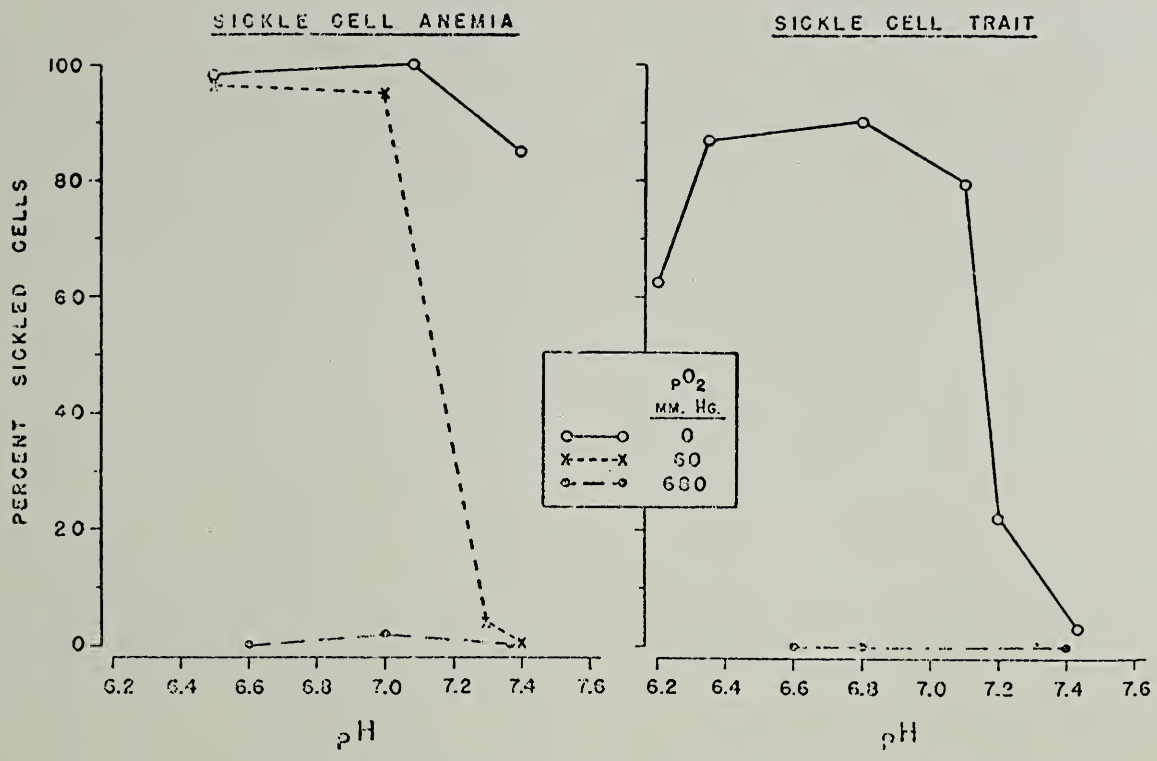


Figure 2 — Effect of pH and PO_2 on sickling.

By electron microscope, the internal structure of the sickled erythrocyte can be shown to be altered. There are crystalline "cables" of hemoglobin which appear in the microscopic preparation as striations; normal cells do not have this type of internal crystalline structure.

The major consequence of sickling seems to be an increase in the blood viscosity. It has been shown that the viscosity of sickle cell anemia blood increases with a decrease in PO_2. This increase in viscosity is especially evident at higher hematocrit values. The anemia of sickle cell anemia may therefore be an adaptive response which permits life in the affected individual to continue, for if his hemoglobin levels were normal his blood viscosity would be dangerously increased. (Figure 1) Chronic anemia with 6.5-7.5 gm of hemoglobin is surprisingly well tolerated in sickle cell anemia.

Erythrocites containing hemoglobin C may also show a crystalline structure. However, the crystals are rhomboidal in shape, do not distort the red blood cell membrane to the same degree as sickle crystals, and are not dependent upon deoxygenation of the hemoglobin. Hemoglobin C may be combined in the same individual with hemoglobin S, leading to hemoglobin SC disease which simulates sickle cell anemia but is usually somewhat milder in its manifestations. Other sickle variants include sickle thalassemia, SD, SF, and other rare combinations of sickle with other than the normal A hemoglobin. These diseases may simulate sickle cell anemia but are usually more benign and therefore may not be diagnosed until adult life. It has been estimated that carriers (AC) of hemoglobin C represent 2.4% of the adult Negro population whereas carriers of hemoglobin S are 8.6%.

The diagnosis of hemoglobinopathy is made from examination of the peripheral blood film, the wet sickle preparation (metabisulfite), the determination of F hemoglobin (which is alkali resistant and is usually increased to a level between 2 and 10% in sickle cell anemia), electrophoretic analysis for abnormal hemoglobins, and electrophoretic quantitation of A and A_2 hemoglobins. The last is necessary in order to diagnose the presence of the thalassemia trait.

The clinical syndrome of sickle cell anemia has made a profound impact upon our understanding of the molecular mechanisms of genetics, but the flow of knowledge from clinical to basic has not as yet produced information of significant benefit to the sufferers from this disease. The abnormality of hemoglobins S and C is dependent upon the sixth amino acid in the long chain polypeptides of the beta chains of the hemoglobin molecule. In S hemoglobin, valine is present instead of glutamic acid in the sixth position; hemoglobin C contains lysine instead of glutamic acid in the same position.

Various renal manifestations are extremely common in sicklemia and can easily be understood if one considers that all the features of the counter-current mechanism in the renal tubules favor sickling: high osmolality with cellular dehydration, acid pH, low PO_2, and erythrostasis. (Figure 2)

Most textbooks of medicine suggest that the classical sickle cell anemia habitus is tall and thin. In actual fact, most patients with sickle cell anemia are normal in appearance. Leg ulcers are one of the worst problems and may occur without any other symptoms of the disease. Cardiac signs are the rule and often a mis-diagnosis of rheumatic fever is made on the basis of a murmur which is actually a hemic murmur secondary to the anemia and the aches and pains which are so characteristic of sicklemia. Vasoocclusive episodes leave scars in the bones which may be visualized on x-ray as intervertebral abnormalities, osteosclerosis of the long bones, or aseptic necrosis of the hip.

The word "crisis" with respect to sickle cell disease is frequently misused and carries with it the danger of shutting off the thinking processes necessary for the appropriate clinical management of a given patient. "Crises" may be categorized as painful, aplastic, hemolytic, or hepatic. Patients with sickle cell anemia have a high susceptibility to pneumonia and to thrombotic disease; these must, of course, be diagnosed in order to be appropriately treated.

Severe painful crises may endure for as long as one to three weeks and are challenges in clinical management. The list of therapeutic agents which have been used in painful crisis is long. It includes vasodilators, analgesics, anticoagulants, oxygen, steroids, and alkali. Even carbon monoxide has been suggested. (It is true that erythrocytes combined with CO do not sickle, but neither do they transport oxygen so that this is an illogical therapy.) The clinical problem is frequently one of achieving pain relief while avoiding respiratory depression. Abundant intravenous hydration and oxygen inhalation make rational sense. In actual fact, oxygen therapy has seldom achieved symptomatic change, perhaps because little change in tissue PO_2 can be achieved.

The cause of the onset of the painful crisis is unknown. Recent evidence suggests that it is associated with decreased arteriovenous oxygen difference secondary to occlusion of a major portion of the microcirculation with shunting of blood around the occluded areas. There is also evidence of an associated decrease in the effective circulating plasma volume.

Aplastic crises are associated with increased severity of anemia to levels as low as 2 or 3 gm of hemoglobin. This can lead to fatal anemia unless recognized and treated with transfusion. It is not unusual to see two concurrent cases of aplastic crises in the same family, suggesting that minor viral infections may be one of the triggering factors.

The "hemolytic crisis" is a rare occurrence. It is associated with rapid and progressive enlargement of the spleen and difficulty in sustaining hemoglobin levels even after transfusion and represents a splenic sequestration crisis.

The hepatic crisis is manfested by an intensification of the usual level of jaundice due to sickled sequestration in hepatic sinusoids. It must be distinguished from transfusion hepatitis, and from an obstructive jaundice secondary to gallstones since gallstones are present in 30% of patients with sickle cell anemia. The chemical profile of the "hepatic crisis" resembles that of obstructive jaundice.

Females with sickle cell disease have a marked increase in morbidity and mortality from pregnancy. The anemia itself may be a major problem and these patients require increased quantities of folic acid during their pregnancies. There is also an increase in pain crises, an increase which bears no clear relationship to the previous presence or absence of crises. The abortion rate, the stillbirth rate, and the premature rate are all high with sickle cell anemia, but only slightly increased with hemoglobin SC disease.

A proper transfusion program during the last trimester of pregnancy may decrease morbidity and mortality. Prenatal clinics should routinely screen for sickle trait and should provide genetic counselling for positive individuals.

There is a need for further controlled studies of the effect of transfusion on maternal and fetal mortality and morbidity, for evaluation of the effect of heparin on the course of pneumonia, the complications of pain crises, and the long-term complications of sickle cell disease, and for studies designed to improve the knowledge of the pathophysiology and logical therapy of painful crises.

It is estimated that there are about two million carriers of the sickle trait present in the United States. These persons while not truly diseased have the possibility of producing progeny who have sickle cell anemia and of being themselves subject to episodes of hematuria and of vasoocclusive episodes at high altitudes with decreased oxygen pressure. This large number of affected individuals emphasizes the magnitude of public health problems relative to education and genetic counselling, at the present time the only available methods of preventing the severe and disabling illness we know as sickle cell anemia. The principal tragedy of sickle cell disease is that it means a lifetime of illness and disability for most of its victims.

AUTOMATING MEDICAL RECORDS

Capt. Charles S. Burger, MC, *Office of the Surgeon General, Washington, D. C., Medical Conference, March 31, 1970.*

To date, there have been some notable failures in attempts to computerize the medical record. This failure has been due to the fact that these systems were developed by trying to utilize the old hand-written medical record, which is not rationally organized. For computerization, first medical records must be more rationally organized, and secondly, physicians must be involved in the important task of defining the record's medical content. To do this the physician need know only enough computer technology so that he has some understanding of the problems computer people must grapple with. The doctor's role is to define for the computer people what patient care information (history, physical examination, lab data, etc.) should be in the system, in what sequence it should be, and how it should look when it comes out.

A totally computerized record system, which has the potential to be utilized in the office of the practicing physician, who is rendering day-to-day care for patients with all types of problems, is presently under development. Too many of the computer projects one reads about have been designed for specialized clinics or situations and not for the general office situation.

The problem-oriented record system has been developed by Dr. Lawrence Weed as the answer to the organization problem. It takes into consideration the four phases of medical action: First, getting a data base, with emphasis on the need for defining and standardizing its content; and second, developing a complete list of problems including medical, social/psychiatric, and demographic. Here the emphasis is on completeness of the list, the need to define problems at the level of understanding which is justified by the data available and the skill of the physician. To assure that the list always reflects these basic principles new problems which arise are added, acute problems which resolve are noted, and lower level problems that resolve into a single diagnostic entity are combined. The third phase is formulating plans in relation to each problem, including sections for getting more information, therapy and patient education; and finally, fourth and most important, progress notes with a separate numbered and titled paragraph for each problem with the numbers and titles corresponding to those on the problems list.

This organization certainly can be used in all written records right now providing many intellectual and educational benefits to the user. In addition to these benefits, however, the problem-oriented organization of the data, as opposed to the random source organized data of the current record, provides the computer people with a rational means for storing and retrieving medical data.

Two developments in computer technology have also hastened development of a computerized record. The first is the touch-sensitive cathode ray tube (CRT) input device which allows very rapid input of medical data. The second is the development of "high level" computer languages to alter the medical content of the record system. This can be learned by physicians with great ease without having to know the details of computer operations. This allows them to "communicate" with the computer and to participate directly in the development and refinement of the medical "software" with little training. It also allows rapid updating of the system as soon as accumulated experience and new knowledge become available.

The computer system being developed by Dr. Weed at the University of Vermont functions in each of the four phases of medical action. This system uses a Control Data computer and "digiscribe" touch-sensitive CRT.

Data Base

A structured, narrative history is presented to the user of the CRT screen, such as a list of symptoms referrable to a given system. The user selects the choice he wants just by touching the screen. Immediately another list, this time of descriptors of the symptom, appears for him to choose from. In this manner he is led through a branching sequence of descriptors with each choice determining the next list of choices that is to appear. The branching capability provides as much detail as is needed and results in a smoothly formulated English narrative, which can be displayed either on the CRT screen or a print-out. The same general principles apply to the entry of a physical examination.

The outstanding features of this means of record entry are that it assures thoroughness (recognition vs. recall), the physician or student learns through constant repetition, and the computer can help the physician think diagnostically by its grouping of associated findings and history.

In addition to recording the physician's history and physical examination, an automated drug ordering sequence is available. Before a drug can be ordered, the sequence takes the physician through frames showing absolute contraindications, then side effects and then other drugs it interacts with. After ordering the drug, the doctor may optionally choose to get more information about the mechanism of action and metabolism, complete with references. This allows him to couple his learning with action taken.

Information correlating abnormalities (lab, history, or physical examination) can also be programmed with suggestions for further tests needed, current therapeutic recommendations, and references for further reading. In a large system, the latest and best medical information can thus be brought to the physician at the time that he needs it. Because of the ease with which the system can be updated, new information can be entered immediately after its utility has been demonstrated. Utilizing the fantastic memory and recall capability of the computer, we can hopefully eliminate rote memory from our medical education system. It should be mentioned that at all times the physician has the capability to type in information that he thinks is essential but that was not contained in the computer sequences. His typed-in data can be analyzed for its merit, and if it represents a flash of insight that should be added to the sequences, then they can be immediately updated. In this manner, the insights of a few can be made immediately available to all.

The implications of this system for medical education at all levels and for patient care are profound. The capability of obtaining multiple print-outs of all or part of the medical record coupled with problem-oriented organization of the data will allow audit of physician performance for the purpose of defining educational needs and for monitoring quality of patient care.

The job of building the system is obviously enormous, and keeping it updated once it is built will undoubtedly be a full-time task of some national medical agency. Dr. Weed and his group hope to have one medical ward at the University of Vermont utilizing this system for all medical records on that ward starting July 1, but certainly general availability of such a system will not come for another five to ten years.

However, because the medical side of the system must be built by physicians familiar with and experienced in the day-to-day care of patients and since the system must in the final analysis be acceptable to the practicing physician, it is important that all are aware of the developments in this field now.

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IN THE VANGUARD

Albert L. Ingram, Jr., M.D., *Secretary of Health and Social Services; President, Delaware Public Health Association. Excerpts from the Presidential Address to the Delaware Public Health Association, 1970.*

It has been two years since the Delaware Public Health Association came into being, two short years which have seen rapidly changing developments in the broad field of public health. We might, indeed, characterize the state of affairs as being crisis-oriented: we are often engulfed by the necessity to stamp out fires, having little time left for thoughtful planning.

We haven't nearly enough of anything — people, tools, monies, materials — throughout the disciplines comprising public health efforts. We have banded together here in Delaware in order to make concerted assault on the many problems common to the various spheres of training we represent.

We presently have about 135 members in good standing with a fairly good cross section of the disciplines concerned with the health of the public. However, considering the number of people involved and interested in this field in this State, this number is far too small.

The healthy cross-fertilization of ideas we generate from our respective disciplines has to be more effective than the restrictive singleness of individual thinking. Our broader goals concern themselves with the penetrating and challenging social issues of the day.

The many aspects of health care and health care delivery for *all* the people is of singular and major significance to us. That we cannot achieve our aims standing alone scarcely need be said. But we must be in the vanguard of those who would coordinate the attack on the problems concerned with health. And this means unprecedented cooperation between and among the private and public interests. There is no room for devisiveness.

In asking me to serve as president of the Delaware Public Health Association, you have presented a grave assignment. These are troubled days and one man, working alone, exerts but little influence. I, therefore, call upon each of you to support my efforts to make the next two years a meaningful and satisfying experience for this Association. I am unable to do it alone, but with your help we just might do it. As my younger friends would say, we just might put it all together.

* * *

THE COMMONER NEW MAN

According to Dr. Barry Commoner, professor at Washington University and outspoken critic of our continuing defiling of our atmosphere and pillage of our natural resources, "A new generation is being raised — with DDT in their fat, carbon monoxide in their systems, and lead in their bones. That is technologic man."

CPC Wilmington Medical Center

Fatal Congestive Failure Following Afebrile Illness in a 59-Year-Old Woman.

Patrick F. Ashley, M.D., *Editor and Pathologist* Alfred E. Bacon, Jr., M.D., *Discusser*

Presentation of Case

A 59-year-old white woman was admitted to the hospital complaining of shortness of breath. Twelve days prior to admission, she developed lower sternal and epigastric discomfort, radiating into the mid back. This was associated with cold sweating, cough, and dyspnea. She was seen by a physician and received ampicillin and Probanthine. The pain subsided, but the dyspnea and cough persisted. Four days prior to admission, physical examination revealed diminished breath sounds bilaterally with wheezing but without rales. There was no temperature elevation. She was given epinephrine and aminophylline suppositories, but the symptoms persisted and were later accompanied by whitish expectoration with some blood streaks. She gave a history variously described as either asthma or allergy for the past fourteen years and was taking weekly desensitization injections. She was evidently allergic to many foods, especially meat. For the past thirty years she had smoked approximately two packages of cigarettes daily.

Physical examination on admission revealed a well developed and nourished patient in acute respiratory distress. The temperature was 37.51 C (98.8 F), pulse 120 and regular, respirations 30, and blood pressure 110/70. There was a generalized maculopapular rash which evidently developed on the day of admission. There was no cyanosis. The chest expanded well, but there were diminished breath sounds and crepitant rales at both lower lung fields, anteriorly and posteriorly. There was no dullness to percussion. The heart was not obviously enlarged. There was a Grade III soft blowing, systolic murmur at the apex. Admission lab studies were: hemoglobin, 12.9 gm; hematocrit, 40%; WBC, 13,400/cu mm with 72% neutrophils. Urinalysis revealed pH of 6, specific gravity, 1.018, and 1+ albumin. SMA profile revealed calcium to be 8.6; phosphorus, 3.0; glucose, 159; BUN, 33; uric acid, 16.5; cholesterol, 217; and total bilirubin, 1.6 mg/100 ml. Total protein was 6.5 gm/100 cc with albumin 3.7 gm. Alkaline phosphatase was 89; LDH, 320; and SGOT, 82 mu/ml. Cold agglutinins were demonstrated in 1:8 dilution. Chest x-ray revealed the cardiac silhouette to be slightly enlarged in its transverse diameter with left ventricular prominence. The cardio-thoracic ratio was 15.5/26.5. There was extensive parenchymal infiltration which appeared predominantly interstitial on the right. Some minimal patchy interstitial infiltration was seen at the left base. There was some thickening of the major fissure on the right side on the lateral view. The left upper lung appeared clear. The visualized pulmonary vascular markings did not appear accentuated. No free fluid was seen. Electrocardiogram showed sinus tachycardia with a rate of 116. The P waves in lead II, III and AVF were prominent. Axis deviation was to the left. Clockwise rotation with S waves was noted through V-6 and T inversion present in V-5-6.

On the second hospital day, the patient was dyspneic and orthopneic with expectoration

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Dr. Ashley is Senior Pathologist, Wilmington Medical Center.

of whitish mucus and blood streaks. Diffuse rales were heard throughout the lungs. She was started on digitalis, furosemide, and tetracycline. By the fourth hospital day, she showed improvement, she was breathing easier, and there were fewer rales heard, but tachycardia persisted.

On the eighth hospital day, sputum culture revealed a *Klebsiella species* and kanamycin therapy was instituted. Temperature elevation which had reached a maximum of 38.89 C (102 F) on the third hospital day now returned to normal. On the ninth hospital day dyspnea and orthopnea still persisted, and she developed marked swelling of the legs and feet. Diminished breath sounds were present at both bases with moist rales. EKG revealed a sinus rate of 96. There was first degree A-V block, but the tracing showed little change from one taken on admission except for lower voltage of the QRS complexes both in the standard and lateral V leads. Marked ST sagging in all the V leads was also noted.

A repeat chest x-ray again showed extensive infiltration throughout the right lung field with no appreciable clearing since the last examination. There was a strong suggestion of some pleural effusion at the right base. The left lung field showed prominent bronchovascular markings with haziness at the base with obliteration of the diaphragm. Additional laboratory studies were: sodium, 130; potassium, 4.0; chlorides, 91; and CO_2 content, 26.2 mEq/liter. Blood pH was 7.45; pCO_2, 38 mm; BUN, 22; creatinine, 1.2; and uric acid, 9.9 mg/100 ml. Repeat WBC was 9,600 with 78% neutrophils. By the fifteenth hospital day, the patient was described as improved. She had lost approximately six pounds in weight, but peripheral edema persisted. There were fewer rales at the bases. The heart still revealed a Grade III soft systolic blowing murmur at the left sternum border and apex with splitting of a second pulmonary sound. The liver was down approximately three finger breadths and was slightly tender. EKG at this time revealed sinus rate of 98. There was little change from the previous tracing with first degree A-V block still present. ST-T abnormality still persisted. Repeat chest x-ray showed considerable improvement in the previously noted extensive infiltration in the right lung.

By the twenty-third hospital day, the patient developed evidence of anorexia and nausea. The blood urea nitrogen showed progressive elevation to 90. The heart rate was regular at 88; no rales were heard in the chest, but there was still a trace of pretibial edema. The following day, the patient's condition significantly deteriorated with acute orthopnea but no apparent cyanosis. Bilateral basilar rales were present. Laboratory studies revealed serum sodium, 122; potassium, 5.3; and chlorides, 70 mEq/liter. BUN was 95; creatinine, 3.8; calcium, 8.4; and phosphorus, 6.3 mg/100 ml. WBC was 24,800 with 84% neutrophils; hemoglobin, 12.6 gm; and hematocrit, 41%. Urinalysis revealed specific gravity of 1.012, with a trace of albumin, 10-12 RBC and 4-6 WBC/hpf. On the next day the patient developed cardiac arrest because of ventricular fibrillation and expired three hours afterwards.

Differential Diagnosis Discussion

Dr. Alfred E. Bacon, Jr.

We have had several CPC's over the last few years, and on some occasions after I have finished reading the protocol, I have had a pretty clear-cut idea of exactly what the problem was. On other occasions, no matter how much time I spent, I had no idea what we were dealing with. This situation is more the latter. The protocol describes a patient seriously ill with pulmonary and cardiac disease, making little progress towards recovery, and finally losing the function of both kidneys totally unexpectedly a day or two before the end of her life. Although I initially felt that this patient died without a diagnosis, I became satisfied that the diagnosis was firmly established by the ninth hospital day and the outcome of the illness was accurately predicted at that time. I plan to go through her illness in stages as was done by her attending physicians.

This 59-year-old woman was an allergic asthmatic person. She was a heavy cigarette smoker so we know that she had some degree

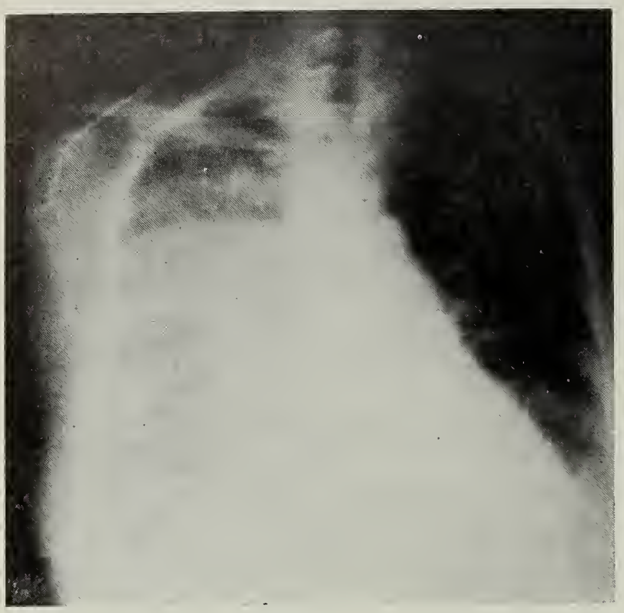

Figure 1
Film of the chest taken on admission, showing some cardiac enlargement and some fullness of the pulmonary conus. Dense infiltrate right lung.

of obstructive pulmonary disease at the onset. Details of her asthma are not described, but it had its onset in middle life, around the age of 45, and we at least know that she had periodic episodes of wheezing. I am fascinated by the occurrence of allergy to meat. I have not heard of this before, but I shall assume that it has no special significance.

This patient had the onset of an acute illness characterized by respiratory symptoms. There is no mention of fever, and although she was seen by her physician, there are no details given of a physical examination. She had cough and shortness of breath; this latter symptom was the most significant. She was treated with ampicillin and Probanthine, presumably to relieve excessive congestion. No cultures were taken, and though this is not the wisest way to practice medicine, it is an expedient manner of handling many office patients, and in this patient this plan of action had no deleterious effect on the final outcome of the disease.

Over the period of the first eight days she did not respond, and when re-examined she had the physical findings of wheezing in her lung fields with diminished breath sounds. Because she did not improve, she was hospitalized 12 days after the onset. A significant event at that time was the onset of increased production of sputum with blood streaking. In the hospital four significant findings existed. She had a rash, described as maculopapular and therefore, in addition to meat, I believe her physician would have assumed she was also allergic to ampicillin. A heart murmur is described for the first time, a grade III blowing systolic murmur at the apex with no obvious enlargement of the heart. This is a new finding. Whether or not it was present at the examination four days ago we do not know, but it is assumed that this patient did not know that she had a heart murmur or this valuable piece of data would not have been excluded from her past medical history. The most impressive thing is that she was sick; she had tachycardia, tachypnea, bilateral pulmonary rales, and she was in severe respiratory distress. Significantly, she was afebrile. The question was probably raised at the time as to whether or not she was in congestive heart failure.

Let us look at the x-ray which was ordered on admission. (Figure 1) On this film we see some cardiac enlargement, and there is some fullness of the pulmonary conus. Her right lung is almost occluded by a dense infiltrate involving most of the lung field. There is no definite area of consolidation, and there is no evidence of pleural fluid. The left lung is amazingly clear, even at the bases. This film is evidence against congestive heart failure being present, but the fact that the heart is enlarged is suggestive for the first time in this patient's history of the existence of cardiac disease.

Let us look at this first EKG. (Figure 2) We see a rate of about 100; PR interval is 0.20, but there is not really a P-Pulmonale. The P wave is upright in lead 1 where ordinarily it would be flat or diphasic. There is some P peaking seen in lead 2, 3 and AVF, and there may be some increased tendency to P-pulmonale but not definitely enough to identify it as such. The most impressive thing is that the axis is left, about 50°. This is certainly not in keeping with what one would expect with her pulmonary history and the findings on her chest x-ray. This is disease of the left ventricle. This is further corroborated by the symmetrically inverted T waves seen in V-5 and V-6. These are anoxic or ischemic T waves and indicate a left ventricle which is under great stress.

Admission laboratory data are not really helpful. She was not anemic, and this is evidence against chronic infection having been present. Is it possible that she had some compensatory polycythemia secondary to pulmonary disease, or was the count so good because she was dehydrated? We do not know the answer to these questions. There is a mild leukocytosis, not so great as one would expect with the degree of infection seen in the right lung.

These data suggest that failure is perhaps a principal finding in this patient. On the second day some further data returned which were helpful. (I do not believe the SMA is ever done on the day of admission, and I therefore believe the data became available on the second day.) Her BUN was slightly elevated at 33, her uric acid was proportionately elevated, and her serum bilirubin was slightly high. These figures, with a slight enzyme elevation, all are in keeping with congestive heart failure. There was prerenal azotemia, slight, with dehydration a factor. We are satisfied by now, however, that she did have serious disease of the left ventricle, which is documented by electrocardiographic changes, and we have the very significant finding of a loud heart murmur, which was known not to be previously present.

We must conclude that something anatomically happened within the heart. Could this be a ruptured chordae tendineae or some destruction of a mitral valve due to bacterial endocarditis? We do not know. We have no evidence of embolic phenomena, which in itself is not unusual in endocarditis, but against endocarditis we have no evidence of a longstanding chronic infection and we have no anemia. Also against endocarditis is the lack of pre-existing heart disease. However, we do not have any valid reason to suspect that a chordae tendineae has ruptured. We don't have anything against the concept except that there is no obvious cause for such an event to have occurred.

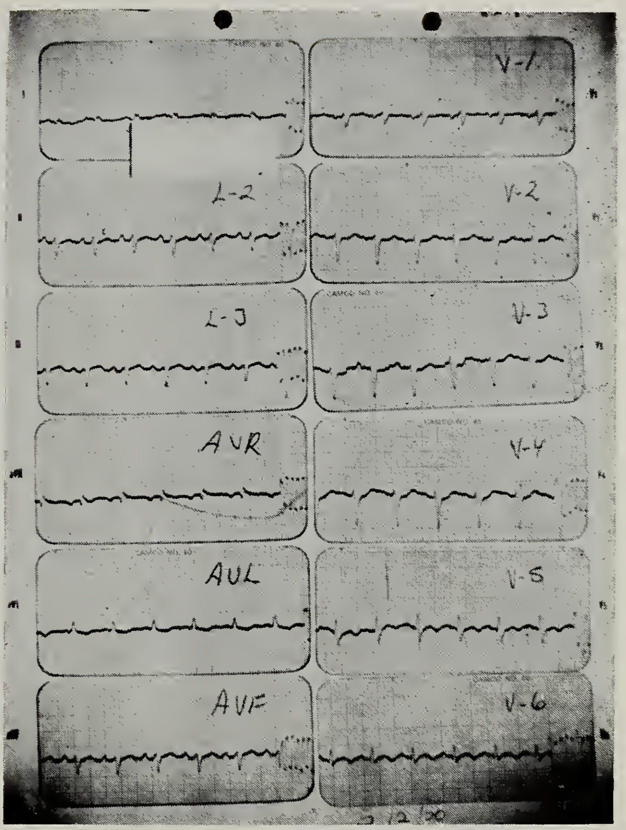

Figure 2

Electrocardiogram taken on admission.

At any rate, therapy with digitalis and a potent diuretic was instituted, and tetracycline, presumably in high doses, was given. I do not have the reason as to why this antibiotic was selected, for I am sure the physician now regretted having used the ampicillin which destroyed his opportunity to have valid cultures taken on admission.

It is pertinent that she was improved subjectively by the fourth day. It is evident that the working diagnosis at that time was interstitial pneumonia plus congestive heart failure due to disease involving the left ventricle with a defect which could either be sub-acute bacterial endocarditis involving the mitral valve or, another cause of destroyed valve function, a ruptured chordae tendineae. Having come to this conclusion by the data available to us

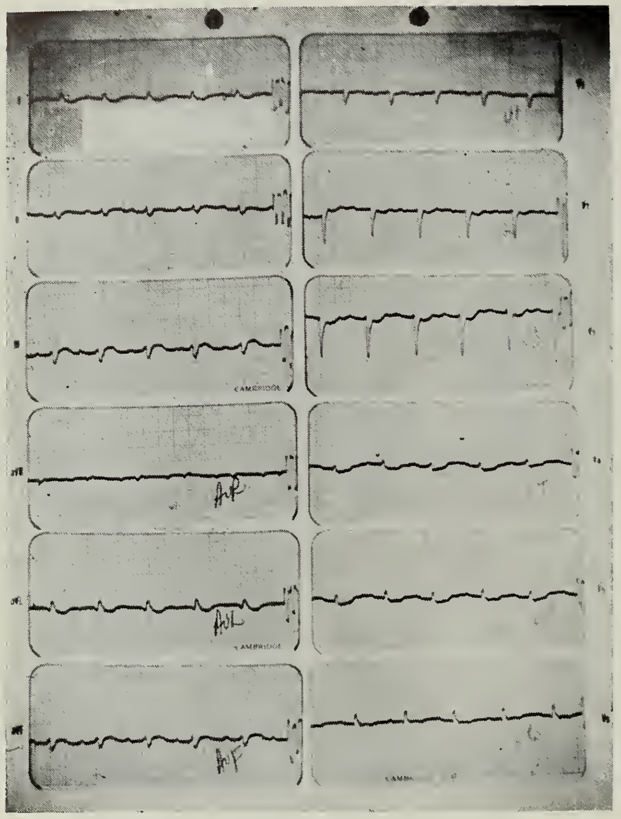

Figure 3
Electrocardiogram showing digitalis effect.

by the fourth day, I am sure that in this interval decisions were made as to what further information could be obtained, and I am sure that consideration of catheterization studies was made, and it is even possible that she was catheterized but these data are not included in the protocol.

Significant information is available for the eighth day; a *Klebsiella* organism was identified in the sputum, and we have thus honest evidence of a real pathogen isolated. For the first time a specific antibiotic, kanamycin, was used. By the eighth day she was afebrile, having reached a maximum fever of 38.89 C (102 F) on the third hospital day. Yet, although improvement continued, we have not positively established the cause of her obvious heart disease, although it is helpful to know the nature of her pulmonary disease. By the ninth hospital day, it was obvious that more than kanamycin was needed, for marked edema became present. I consider edema in a situation like this to be due to failure of one of three organs to function properly. That it was not due to the kidneys was established by the fact that the BUN and creatinine and uric acid had all approached normal. This shows good renal function. There is nothing to make one think that the liver had significantly altered its function, and again the increased accumulation of edema points to the violent myocardial disease which was occurring. Repeat electrocardiogram done at this time shows only the addition of digitalis effect (Figure 3), and a repeat chest x-ray shows no significant improvement. (Figure 4) If anything, the x-ray is worse, for there are bilateral pulmonary changes with a little bit of fluid at the left base and certainly some at the right base. Laboratory data on this occasion verify the fact that serious pulmonary disease was not present. Her pCO_2 was 38 and her pH slightly on the alkaline side.

It is possible that the hyperventilation caused her to blow off CO_2 without a corresponding reduction in bicarbonate by the kidney and that this accounted for alkalosis. In addition, the intensive use of diuretics I am

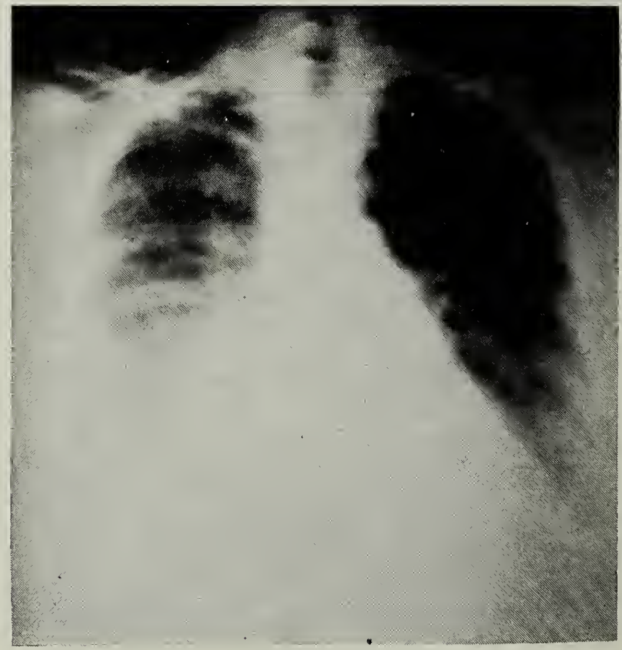

Figure 4
X-ray showing bilateral pulmonary changes with fluid at the bases.

sure led to a mild hypochloremia, and this contributed to the alkalosis. At any rate we have established that pulmonary disease was not her major problem and that all the evidence at this time documents that this patient had serious myocardial disease involving the left ventricle due to an acute change in the structure of the left side of the heart resulting from either a ruptured chordae tendineae or bacterial endocarditis. It would be most unusual for *Klebsiella* to be an etiologic agent in endocarditis, for there was not known preexisting heart disease and the patient had not shown as much evidence of toxicity as I would have anticipated with *Klebsiella.* Infection was not established as being a major event. She was afebrile, her leukocytosis was decreasing, and the identified organisms were covered with a potent antibiotic.

At this stage it seems evident that the mitral defect that was causing the disturbance of hemodynamics had to be something other than bacterial endocarditis. We cannot be positive of this, but the accumulated evidence indicates that a chordae tendineae had ruptured for an unknown reason; this led to the murmur and caused such grave left ventricular disease. If the consideration for a diagnostic catheterization was not made before, it certainly was probably discussed by this time. She may have been catheterized, or she may have been considered too sick for the procedure. It is also possible that the physician at this time hoped that the patient had sub-acute bacterial endocarditis and that kanamycin could be of some help in alleviating the disease, for it was probably feared by now that her illness was going to have a fatal outcome.

On the 15th day our thoughts do not change. The liver descended and became tender, compatible with congestive heart failure. There was weight loss secondary to the intensive dehydration. The third chest x-ray, as anticipated, did show significant clearing. (Figure 5) This confirms that kanamycin was helpful in alleviating the *Klebsiella* and that the intensive therapeutic program has caused dehydration and taken some stress off the heart. There is again little change in the third electrocardiogram. (Figure 6) This continued to show evidence of a left ventricular pattern with digitalis effects without any new conduction defects.

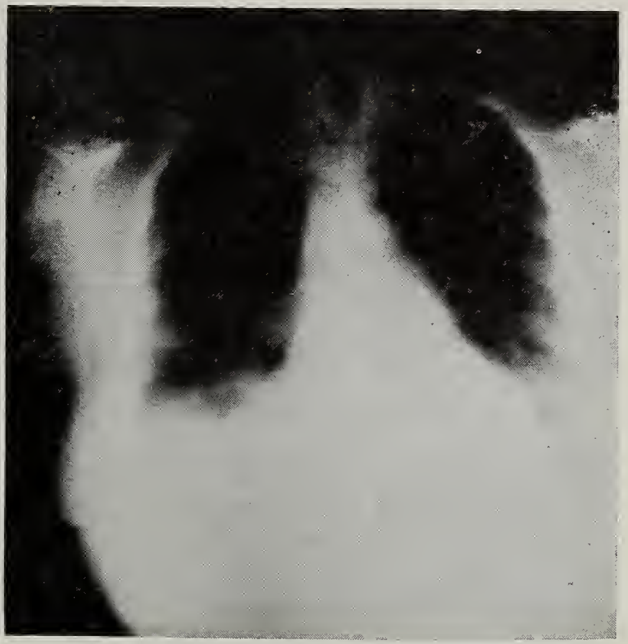

Figure 5

Film of the chest showing significant clearing.

This patient was in severe congestive heart failure, and when we see the renal deterioration which occurred, we suspect one of several things. If bacterial endocarditis was responsible for her heart disease, was there glomerulonephritis associated with endocarditis or with multiple embolic phenomena occurring in the kidneys? We do not know the answer, but we know that if this patient was merely in severe congestive heart failure without endocarditis, anoxic changes of the kidneys leading to tubular necrosis and injury could have caused identical renal functional deterioration. We can see by the chemical studies that the serum sodium and chlorides were pushed to a very low level by the intensive program. That a losing battle was being fought was clear by the ninth hospital day. The fourth chest x-ray again shows accumulation of some fluid at both bases and an increased infiltration of the right upper lobe of the lung. (Figure 7)

The electrocardiogram now showed further deterioration in the sense that the QRS conduction time has widened to 0.12 seconds.

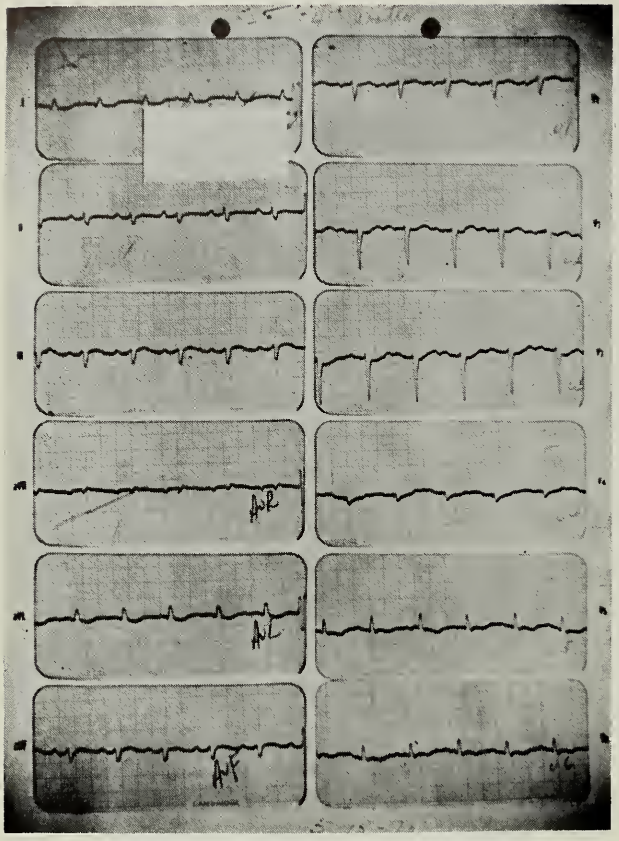

Figure 6

Third electrocardiogram, showing evidence of a left ventricular pattern with digitalis effects.

(Figure 8) The deep S waves in V2-V3 suggest that there is some left ventricular enlargement, hypertrophy or dilitation. The increased conduction time can be due to hypertrophy or anoxic changes within the conducting system. The fact that there is an increased QS conduction time is a grave myocardial sign.

All these electrocardiograms have shown in common low voltage of the QS complexes. Had this patient had a pericardial effusion as a cause for her problems, I would not have expected so much voltage to be seen in the P waves. With her history of pulmonary disease, a consideration for emphysema can be made with a pushing of the heart away from the chest wall and secondary decrease in voltage, but we know that myocardium under great stress and in an anoxic situation will have lowered voltage. I favor this latter cause for the reasons previously mentioned.

The accumulation of facts given in the protocol now lead me to believe that this patient had some pulmonary disease which was not significant, but a catastrophic event happened within the left ventricle because of either endocarditis or a ruptured chordae tendineae. The evidence is against the overwhelming infection of endocarditis, for she was not that toxic. Her picture was that of myocardial insufficiency, and I therefore conclude that this was due to a ruptured chordae tendineae. Her downhill course was due to progressive left ventricular failure, the terminal events being ischemic renal disease related to the decrease in cardiac output associated with the very grave myocardial insufficiency.

Dr. Shellenberger: What do you think of the chest pain early in the disease?

Dr. Bacon: As I said earlier, looking at this from the point of view of the physician, I think that if I had a patient with a long-standing pulmonary history and she called saying she was coughing and short of breath and had some chest pain, I would assume that

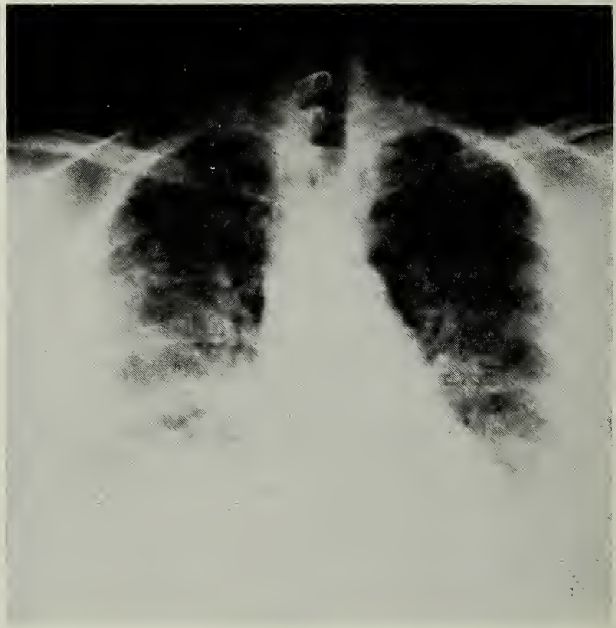

Figure 7

Film taken on ninth hospital day demonstrating accumulation of some fluid at both bases and an increased infiltration of the right upper lobe of the lung.

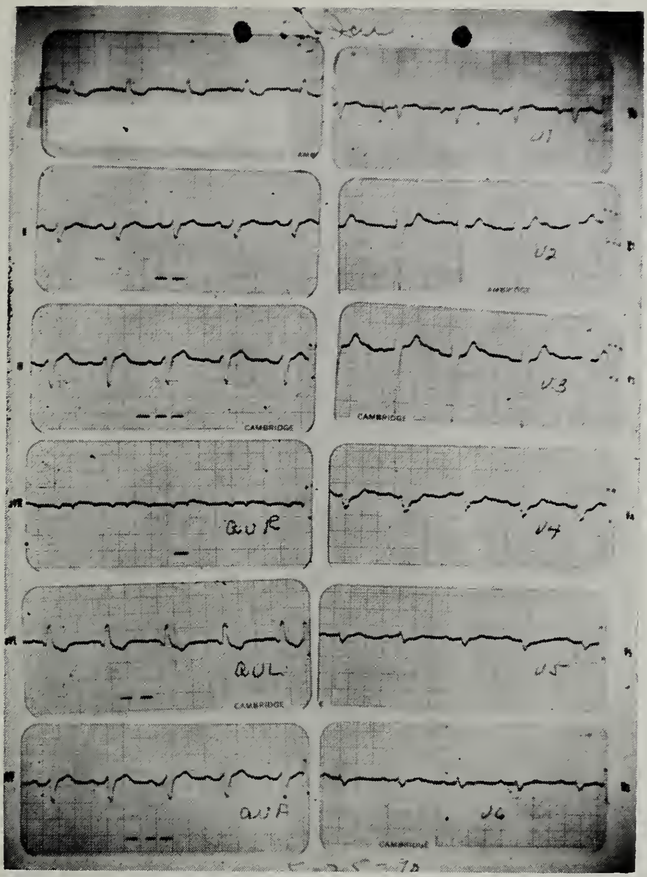

Figure 8

Electrocardiogram showing further deterioration by increased conduction time.

this was the chest pain that we often have seen in association with bronchitis. It is not mentioned again, and I honestly think that at that time I would have dismissed it.

Dr. Frelick: What do you think of the possibility of bronchogenic carcinoma perhaps with pericardial involvement?

Dr. Bacon: I had not considered it very seriously. The picture was not that of a pericardial effusion. The x-ray might look like it, but her course was not what one would expect with a pericardial effusion and therefore I did not consider this as a possible cause.

Dr. Hofford: It is interesting to note that each person thinks in his own sphere. Dr. Bacon thinks of the heart, and Dr. Frelick thinks of cancer, and I think of the lung. It seemed to me that multiple pulmonary emboli might be a very significant cause for such a disease. I admit that the electrocardiograms are evidence against this, for she should have developed cor pulmonale. In addition, I should comment that the fact that the patient was alkalotic but had normal pCO_2 is evidence that she did not have severe pulmonary insufficiency. Very often the hyperventilating patient can blow off CO_2 through his good pulmonary tissue. We really do need measurements of arterial saturation to see how anoxic this patient was, to see how much anoxia was contributing to hyperventilation.

Dr. Bacon: I seriously considered multiple pulmonary emboli, and, in fact, I considered that she ended with a thrombosis of the vena cava including the renal veins, to account for the terminal severe edema and ultimate renal failure that she had. Again, the electrocardiogram dispelled me from this direction, for it is certainly the picture of left heart disease rather than right heart disease that one would expect with multiple pulmonary emboli.

Pathological Discussion

Dr. Patrick F. Ashley

At autopsy, there was advanced coronary artherosclerosis with a complete atheromatous occlusion of the right coronary artery. An extensive posterior myocardial infarction was present with a complete rupture of the posterior papillary muscle near its base. (Figures 9 and 10) Microscopic examination showed extensive myocardial necrosis with peripheral areas of healing. The infarct was probably around four to five weeks in duration. There were generalized acute and chronic passive congestion and edema, and the liver revealed acute congestive central hemorrhagic necrosis. The lungs, in addition to the signs of failure, revealed two small infarcts in the left lower lobe and microscopic evidence of chronic asthmatic bronchitis.

Spontaneous rupture of a papillary muscle is estimated to occur in approximately 1% of acute myocardial infarctions and is invariably fatal; in fact, it leads to death in less than 24 hours in over 50% of the cases if the rupture is complete. Typically, there is a dramatic development of pulmonary congestion and a Grade II to IV harsh apical systolic murmur without a thrill. In contrast, rupture

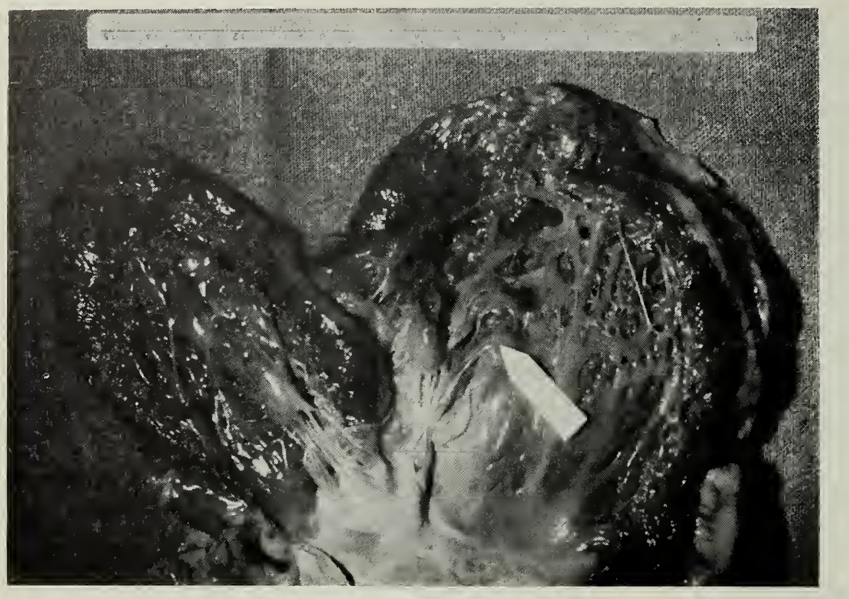

Figure 9
Arrow points to site of ruptured posterior papillary muscle.

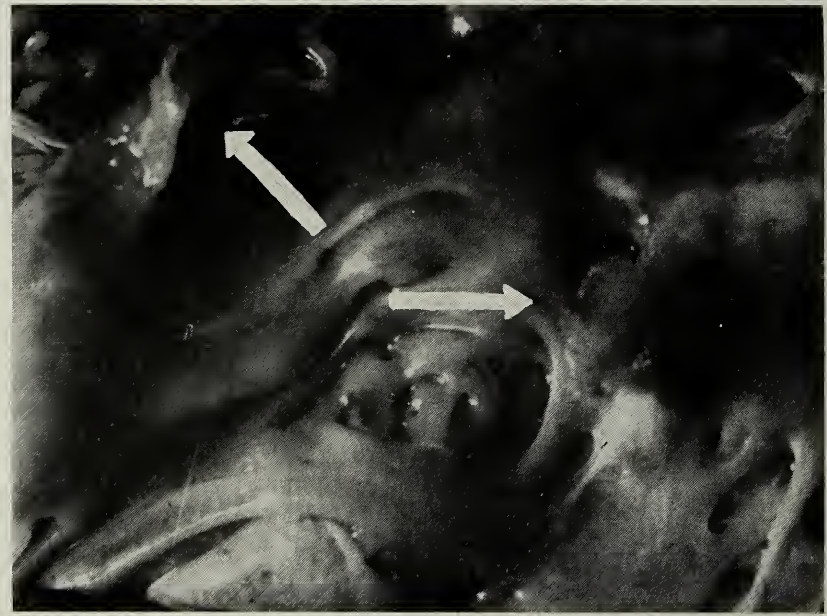

Figure 10 (close-up)
Note free end of ruptured papillary muscle.

of the ventricular septum, which also occurs in approximately 1% of myocardial infarctions, usually produces a thrill with this harsh systolic murmur.

Rupture of the posterior muscle of the left ventricle occurs more frequently than the anterior muscle possibly because of its remoteness from the source of blood supply. In most cases, the rupture occurs during the first two weeks of infarction. Infarction and ischemic fibrosis of the papillary muscles are probably more common than generally realized. Certainly, papillary muscle dysfunction is now recognized as a common complication of acute infarction occurring in as many as two-thirds of the cases.

Rupture of the main body of the muscle is incompatible with survival. Attempts to replace the mitral valve have been attempted, but frequently are unsuccessful because of the extreme friability of the muscle. Partial rupture of the tip with evulsion of a few attached chordae tendineae may be surgically correctable if the patient survives long enough for healing of the infarcted muscle to occur. One must remember that rupture of chordae tendineae may occur as a complication as bacterial endocarditis.

Letters to the Editor

To the Editor:

In the February 1971 issue of the *Delaware Medical Journal* "Editorials" was a forthright presentation by Dr. William J. Vandervort entitled "Some Thoughts on Medicine in 1971." The deep concern for the private practice of medicine was apparent as he discussed the critical issues involved in providing care for the sick, as well as the fiscal responsibilities to the citizens and the State of Delaware.

Following this editorial was another by "R.B.F." entitled "A Case Against a Parasitic Hospital." This article written by a full-time employee of the Wilmington Medical Center attempted to degrade all that does not fit into the master plan of our medical center which is highly beset with problems. Apparently his loyalty to his employer, as well as his complete lack of personal experience in the problems and responsibilities in providing 24-hour health care as demanded in private practice allowed him to be so deluded.

It appears to the undersigned that after five years of merger of the Wilmington Medical Center, the accomplishments leave much to be desired. Merger, if we all will recall was originally suggested for "economy." This was obviously an unachieved goal and was rather quickly discarded with the ideal of "teaching and research" substituted. A great many unattainable goals and sins of omission are possible to lump under the category of "teaching."

Now when a competing facility appears on the horizon a great hue and cry is raised against "skimming the cream" and its being a "parasite to the host." Two points might be raised here. Isn't it strange that the "milking" of the present private patient in the Center is never mentioned in order to support the indigent, the teaching, the research, the excess administration, the inefficiencies.

Secondly, the criticism leveled against a new private hospital could just as well be applied to the St. Francis and Riverside hospitals as being a "parasite to the host" yet no voices are heard against these installations. The AID facility with 250 beds will approximate the total of these installations combined and offer complete facilities for 24 hour emergency, ICU and the group practice of medicine.

Now, after many high powered and expensive consultants (Ernest Shortliffe, M.D.; Paget, Cresap and McCormick; Booze, Allen and Hamilton), we have a new consultant Mr. Edgar Gemmell to ascertain the reaction of the community to the proposed expansion of the Center. Isn't it odd that this was never done long before this — or even that the Center finds it necessary to do at all?

And what if Mr. Gemmell's survey is negative, which it might very well be? Wouldn't we all be happy to have a facility for expansion not costing the community a dollar and at the same time contributing its share of the tax load. This seems a worthwhile alternate to implement proposed health care programs, including pre-paid group practice.

Let us not put all our eggs in the Wilmington Medical Center basket. Let us as physicians providing the day-to-day care in the community keep open some options for alternate plans. Certainly let us not be deluded into the game of name calling as a "parasite to the host." Perhaps it might not be out of order to suggest that the Center is in reality the "parasite to the community" and it is time for the fresh ideas of competition to come forward. Monopoly in any form is odious.

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Editorials

RESPONSIBLE PHYSICIANS' RESPONSE TO IRRESPONSIBLE PRESS

PEOPLE MAY BE RATS BUT RATS AREN'T PEOPLE

There is a special breed of nonprofessionals who have enjoyed considerable publicity from practicing a journalistic exercise, called by Jean K. Weston, M.D., "Dissemination of Conjectural Medical Information." This activity has enjoyed wide reportage in the lay press and created in many cases enough alarm to cause responsible public officials to make hasty regulatory rulings.

In the widely publicized but not too well understood cyclamate story, the conjectural nature of information publicized involved: 1) loose interchange of words "*tumor*" and "*cancer,*" 2) broad inference that teratogenic effect seen with thalidomide *might* appear, 3) disregard of the abnormally large ingestion of cyclamate necessary to produce bladder tumor in rodents, 4) complete lack of confirmed case of tumor formation in man at any dose level.

Two very important medical considerations have evolved from the cyclamate case:

1. The Delaney Amendment should be reviewed carefully so that future backlash from the amendment would not remove *medically useful therapeutic* agents even though the amendment primarily involves food additives.
2. The ready conjectural extrapolation of animal data to humans, especially in the field of drug therapy, is to be deplored, particularly when *nonprofessionals* do the extrapolating.

Recently it has become politically and socially acceptable to loudly demand ultimate and absolute protection of the consumer. In responsible therapeutics so much depends on multiple factors of: 1) correct diagnosis, 2) correct medication, 3) correct dosage, 4) balancing the potential benefits against potential harm, 5) greater knowledge of interactions between multiple drugs used at any one time, and 6) the patient's physical condition.

It is the physician's responsibility to be extremely skeptical of any information for which there is no valid medical or scientific support—whether from lay press and communications media or from professional sources such as pharmaceutical companies or teachers. Critical, healthy skepticism and knowledgeable practice of therapeutics should not be based on conjectural information. Even certain positions taken in these columns as editorials should be studied carefully and not be considered "facts" unless all aspects of the position taken are reviewed.

K. K. Kimura, M.D.

* * *

SICKLE CELL HEMOGLOBIN

A Challenge to Clinician and Researcher

In recent months there has been considerable attention drawn to apparent paucity of preventive medicine and reaserch efforts in sickle cell anemia compared with the efforts in other diseases of similar prevalence. By many standards, the control and treatment of this problem seem inadequate and ironically, this is one of the few diseases where clinical and basic research findings are so clearly related.

When J. B. Herrick presented the index case of this illness in 1910 at the meeting of the American Association of Physicians, he was unable to engender any discussion. Not until 1927 were significant advances made, relating increased sickling to lower PO_2 and to lower pH, and the defect localized in the hemoglobin itself, as opposed to a defect in the red cell membrane. Finally, the molecular basis of hemoglobinopathies was launched in 1945, the result of a chance train conversation between W. B. Castle and Linus Pauling; the latter applied the newly developed technique of electrophoresis to sickle hemoglobin and was ultimately able to demonstrate the single amino acid substitution on the beta chain.

Of the sixty or more known mutations affecting the external surface of the hemoglobin molecule, none are harmful to heterozygotes, and only three harm homozygotes; the detrimental effects are related to intermolecular interactions as contrasted with intramolecular derangements, the latter being associated with the more harmful and more numerous mutations affecting the interior portions of the hemoglobin molecule.

Recent work has been directed at the effects of interaction of various abnormal hemoglobins, such as S-C, SS-Memphis, etc. It has been found that certain abnormal hemoglobins (eg, Hgb C, Hgb F) aggravate or ameliorate the detrimental effect of certain other abnormal hemoglobins (eg, Hgb S). These interactions manifest themselves primarily by altering the tendency of the resultant hemoglobin complex to gel, the gelling being the process whereby tactoids or "crystals" are formed.

These hemoglobin interactions help our understanding of the varied clinical courses of patients who, at first analysis, seem to have the same disease, eg, S-C disease, but who, with refined tests, are found to have different diseases, eg, Hgb S-O_{ARAB}. By utilizing special electrophoretic techniques, many hitherto unexplained clinical variants are now being shown to involve "silent" substitutions in the hemoglobin molecule, which affect binding sites in sickling cells.

ROGER B. THOMAS, JR., M.D.

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DOCTORS' HELPERS

Physician's assistant or assistant physician? Nurse clinician, nurse specialist, or just, nurse? Are "physicians' assistants" really a new category of health personnel or just a formal way of recognizing an old one? Anyone who has ever helped a doctor by holding a retractor, preparing a patient for examination, weighing or taking a temperature is really a physician's assistant, call him (or her) what you will.

Need physicians' assistants be licensed? Should they be? Is there a need for them anyway? Should these doctor helpers be nurses or non-nurse technicians trained specially for their jobs? Should we just expand the duties assigned to nurses? Who then will take over the clerical type duties now being done by nurses? Are nurses willing to do more than they are now? Will we have nurse practitioners?

The results of a recent survey of the Medical Society of Delaware regarding their views on this subject have recently been published in the JAMA.[1] The results were in many ways unexpected. More physicians said they would use "physicians' assistants" than thought there was a need for them in this community. And as a group the general practitioners saw the least need for physicians' assistants.

Unless the creation of the new specialty of Family Practice, replete with its own board examinations, greatly expands the thinning ranks of primary physicians (and we think a rose by any other name is still a rose; GP's called Family Practitioners are still GP's and their ranks will continue to thin), assistants of all sorts will be needed if patients who do not need heart or kidney transplants are to get annual checkups or have their sore throats looked at.

And even if our pessimism proves unfounded, and Family Practitioners abound in the cities, they'll certainly never abound again in the sticks. Physicians' assistants are going to take the place of the lamented but indubitably extinct country doctor.

Who will train them? How should it be done? Another medical problem (there seem to be so many!) to think upon.

B.Z.P.

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[1] McGrath J, McKusick M and Paulshock B: Need for physicians' assistants. JAMA 14:147, 1970.

Delaware Academy of General Practice

MEDICINE BY DECREE

Medicine by decree as exemplified in recent years by the Food and Drug Administration has brought much criticism from grass root physicians.

In the following article, Mac F. Cahal, Executive Director of the American Academy of General Practice, asserts that proposed regulations relating to the marketing of drugs in fixed combinations are "patiently regressive," and calls for the establishment of lines of communication between those engaged in research and the practicing physicians.*

"I would like to comment on new Food and Drug Administration regulations published in the February 18 issue of the *Federal Register* (Vol. 36, No. 33). These regulations concern the marketing of drugs in fixed combinations. I make these comments as executive director and legal counsel for the American Academy of General Practice, the nation's second largest medical association. The Academy presently has 31,000 family physician members.

"I submit that the proposed regulations are patently regressive. In essence, they seem to call for a return to pre-20th century days when all drugs were carefully compounded by the local pharmacist — at considerable expense and inconvenience to the patient. This approach was less than satisfactory and the pharmaceutical industry responded by making precompounded (or combination) drugs available. In the process, the industry (a) simplified the doctor's prescription-writing task and (b) made taking medication more convenient and less costly to the patient. The new regulations, it seems to me, would negate this bit of technologic progress and result in higher health care costs.

"How can the FDA justify lowering the boom on any combination drug which it deems not useful to "most" of the patients for whom it might be prescribed? I suggest that an FDA-appointed panel and a group of physicians in the active day-to-day practice of medicine might have very divergent ideas concerning the usefulness of a given drug (or drug combination) and to the best of my knowledge, little if any effort has been made to equate these divergent views. Such an effort would be worthwhile and it should be made prior to adopting further regulations which would make the practice of medicine more difficult and complex than it already is. In any event, why remove a drug from the market simply because it allegedly is not useful to "most" of the patients for whom it might be prescribed? It will thus axiomatically be of use to some or many of the patients for whom it's prescribed and the regulations seem designed to deny it to them.

"I represent physicians who are not, for the most part, engaged in research. Instead, they are busy family physicians dedicated to helping people who are ill, injured or infirm and also to preventing the many ailments that beset mankind. I am convinced that the Food and Drug Administration would do well to open up a channel of communication with these physicians and not rely so heavily on the views and opinions of talented research scientists who are nevertheless not on the firing line. In my opinion, the regulations which appear in the February 18 issue of the *Federal Register* will serve principally to increase the cost of medical care and make the physician's prescription-writing chores more complex."

JACK GELB, M.D.

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* From the current *Headquarters Bulletin,* American Academy of General Practice.

President's Page

PROFESSIONAL IDEALS

Report of AMA Judicial Council, Adopted by the House of Delegates, December 1, 1970

Recently many letters have been received by the Judicial Council complaining of an apparent preoccupation by an increasing number of physicians with the financial aspects of their medical practice.

The Judicial Council reaffirms that the laborer is worthy of his hire and the physician is entitled to reasonable compensation for the service he performs. At the same time, the Council must point out that the "prime object of the medical profession is to serve humanity; reward or financial gain is a subordinate consideration."

In 1934 the House of Delegates said "one of the strongest holds of the profession on public approbation and support has been the age old professional idea of medical service to all, whether able to pay or not." The Council believes it would be helpful if the House were to reaffirm that policy at this meeting.

Some physicians seem to believe that the practices of business enterprises should be utilized by physicians in order to "encourage prompt attention to medical accounts." They ask, "Why shouldn't we be paid as soon as the dry goods store, the grocer, or the TV service man?"

Ideally, the physician should be paid promptly. If the physician is not paid as promptly as other creditors, he should recall that he is a professional man with all the perquisites that term applies. Our patients in large number carry insurance to cover the cost of medical services. (They do not insure payment of the cost of other professional or business services to any notable extent.)

Governmental programs have been instituted and are being developed continually to provide payment for medical care to those who are unable to provide this payment.

If the profession were to cast aside its ideals and traditions and adopt the practices of business, trade, or industry in dealing with patients, then the profession would be casting aside also the perquisites that have been accorded it. The increase of collections by adding 1½ per cent interest per month to a bill of an honest patient embarrassed because of inflationary trends, or the bill of some retired person living on a small pension is, in the opinion of the Judicial Council, not justifiable. It simply is not worth it from any point of view. The imposition of a penalty on the bill of a "deadbeat" is not likely to cause him suddenly to change; the chances are he will become even less likely to pay.

A physician who demands a satisfactory credit report on an individual before accepting that individual as a patient is demonstrating that to him financial compensation is the prime object and reward of his profession.

A physician who publicly refuses to see a patient who had an appointment, because the patient's balance on account was "too high" is demonstrating that he respects neither himself nor his profession.

These examples are real. The Council believes they are the exception and they seem more conspicuous because of that fact. Nonetheless, these practices reflect adversely on the whole profession and especially on the countless physicians who extend credit willingly or write off old accounts because they are dedicated to serving mankind.

The Judicial Council therefore recommends that the House of Delegates reaffirm that the prime object of the medical profession is to render service to humanity; financial gain is a subordinate consideration.

The Council recommends that the House call this reaffirmation of policy to the attention of constituent and component medical societies, asking them to urge all physicians to adhere faithfully to the professional ideals, traditions, and goals of American medicine.

I call the aforementioned to the attention of all members of the Society.

RHOSLYN J. BISHOFF, M.D.

NEW PATIENTS WELCOME!
(But Do They Know It?)

Wilburn L. McClure, Jr.

I tried playing a little game recently. Every time I saw a physician, I asked him what he thought was the most important consideration in welcoming new patients.

Here are the four most often mentioned responses I received: a friendly greeting by the receptionist, a well-decorated and comfortable reception area, up-to-date magazines, and soothing music throughout the office.

The above are all well and good. But, what do *you* do that's special for the new patient? After all, he or she doesn't know a thing about your background, your practice style (fast or slow, on-time or often late, gentle or rough, etc.) and, just as important, about your range of services, your hours and your fees.

Here's a consensus of opinions of several doctors in Delaware (and dozens from elsewhere) on how to successfully manage the initial office visit of a new patient.

1) Determine the nature of the visit. Schedule an appointment which best suits the needs of the patient and allows adequate time for an initial visit.

2) The receptionist should always be on-the-spot to greet new patients and to show them where to hang coats, where the lavatories are, and to obtain preliminary essential personal data. At the same time, she can brief the patient concerning regular office hours, emergency routines, and so forth.

3) In an examining room, an aide can, if you desire, *begin* to record a family and personal medical history, plus basic data such as temperature, height and weight.

At this point, the patient's file should be placed on your desk for review. A quick glance at the facts recorded should give you plenty of important things to discuss with the patient.

4) Now you are prepared to enter the examining room, greet the patient by name and introduce yourself. *(Proper scheduling* will be evidenced if the doctor sees the patient within fifteen minutes of arrival at the office.)

5) Remembering that new patients are more likely to be nervous or even scared during initial visits, complete the medical history, listen carefully to all complaints, complete the examination and immediately record the facts, *privately and uninterrupted!*

6) Review with the patient exactly what you've done thus far.

7) Patiently, yet positively, discuss your findings. Explain the need, if it exists, for requesting copies of records from former doctors, the need for additional tests, prescriptions, and/or the need for a consultation with another physician.

At this point, be sure the patient has ample time to ask questions. You must, however, be very careful not to allow the situation to get out of control as it may lead the patient to believe similar amounts of time will be allowed during subsequent visits.

The patient should feel by now that the doctor has a genuine interest in his case. Depending upon the diagnosis, instruct the patient to make an appointment or to phone on a specific date to report his progress.

8) Before the patient leaves briefly discuss the scope of your services and fees.

9) An aide should assist the patient toward leaving the office. She should make sure that all instructions are understood, appointments are made, etc., and that the patient has made complete arrangements for payment of his bill.

Maybe that's not all there is to it, but we've covered the most important basic situations. If you've seen to it that the patient was properly greeted, handled calmly but firmly, and educated concerning his medical needs, you've done a great service.

10) One thing more: Every once in a while, just as often as time permits, try treating your old patients like new patients. They'll love it!

Mr. McClure is a professional management consultant in Moorestown, N.J. He has worked with physicians in private practice since 1959.

Herewith begins a series written for the Journal on office management.

In Brief

In the News

Recently elected officers for the Delaware Psychiatric Association are: President, Richard Winkelmayer, M.D.; President-Elect, Patricia Mack Toner, M.D.; Secretary-Treasurer, Mary Elizabeth Traynor, M.D.; Parliamentarian, Paul Dunn, M.D.; delegate to the Assembly of the American Psychiatric Association, Lidia Bales, M.D., with Nicholas P. Bash, M.D., alternate.

Among those recently appointed to the Council on Mental Health by Governor Russell W. Peterson is John A. J. Forest, M.D.. Mrs. A. Felix duPont, Jr., replaces William J. Vandervort, M.D., who resigned. Alan L. McClelland replaces Daniel A. Alvarez, M.D.

William J. Holloway, M.D. was reappointed to the State Board of Medical Examiners by Governor Peterson and John H. Furlong, M.D. was appointed, each for four-year terms.

"Factors Associated with Long-Term Survival of Diabetes," authored by C. Anthony D'Alonzo, M.D., and Sidney Pell, Ph.D., appeared in the December 7, 1970 issue of JAMA. During the ten-year study period, the death rate of the diabetics (370 in number) was 25.4% compared to 9.7% among the controls (370), a ratio of about 2.6.

Mustafa Oz, M.D. has been granted Fellowship in the American College of Cardiology. Dr. Oz is among a group of 211 from the United States and Canada recently admitted to the College's highest membership classification.

John M. Levinson, M.D. of Wilmington has been named to the Board of Directors of the National Association of Blue Shield Plans. Retiring from the Board was H. Thomas McGuire, M.D. of New Castle.

Speakers on "Ask the Doctor"

Speakers for June 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: June 1, Mary E. Traynor, M.D., *The Mental Hygiene Clinic;* June 8, Marjorie J. McKusick, M.D., *The Delaware Adolescent Program, Inc.;* June 15, Kenneth M. Corrin, Jr., M.D., *Preventing Heart Attacks;* June 22, Lawrence Katzenstein, M.D., *Virus Diseases of the Skin;* June 29, Robert L. Meckelnburg, M.D., *Diagnostic Use of Radioisotopes in Medicine.*

Films Available

Films available from Blue Cross-Blue Shield of Delaware for showing to community groups are *The Other Guy* (a one hour film on alcoholism); *Movable Scene, Flowers of Darkness* and *Bridge from Noplace* (all on narcotics abuse); and *Beware the Wind* (air pollution). Call Mrs. Margaret B. Towers, Manager, Public Relations at 658-2441 to schedule showings.

New Booklets Available

Copies of *The Alcoholic American* are available free from Blue Cross-Blue Shield of Delaware, 201 W. 14th Street, Wilmington, 19801. The booklet attempts to deal with the prevention of alcoholism, rather than its treatment.

Facts about Plastic Surgery of the Nose, by the American Academy of Facial Plastic and Reconstructive Surgery, Inc., lists important prerequisites and, especially, the sense of realism and emotional maturity patients should have when approaching nasal surgery. Sample copies of the brochure are available from the American Academy of Facial Plastic and Reconstructive Surgery, Inc., 1110 W. Main Street, Durham, N. C., 27701.

New Orthopaedic Textbook

The American Academy of Orthopaedic Surgeons has published a standard textbook titled "*Emergency Care and Transportation of the Sick and Injured,*" for use by both student and teacher. It is authoritatively written by more than 100 contributors and was compiled by members of the Academy's Committee on Injuries. The volume is available at $4.95 prepaid per copy from the American Academy of Orthopaedic Surgeons, 430 North Michigan Avenue, Chicago, Illinois, 60611.

AMA Statement on Venereal Disease

The problems of VD are many: Permissiveness, limited staffs in public health departments, insufficient funds, reluctance on the part of physicians to report VD cases, and ignorance on the part of the public about the dimensions of VD, prevention and treatment.

In view of the alarming increase in reported cases of infectious syphilis and because gonorrhea is now pandemic in the United States, the Council on Environmental and Public Health, American Medical Association, has prepared the following statement for the information and guidance of medical societies:

Gonorrhea ranks first and syphilis third among the reported communicable diseases in the United States. Last year, infectious syphilis rates were eight percent higher than the year before, with an estimated incidence between 70-80,000 reported cases; there are 250,000 of all forms of syphilis estimated to be diagnosed and treated each year.

At the same time, gonorrhea morbidity exceeded 573,000 reported cases. Gonorrhea is pandemic in the United States, with an estimated two million cases.

Physicians in private practice treat approximately 80 percent of the syphilis and gonorrhea that come to diagnosis but report to public health departments only one out of every eight cases of syphilis and one out of every nine cases of gonorrhea they treat. Medical societies are urged to cooperate and give broad support to public health authorities.

Editor's note:

In Delaware by law the physician who makes a diagnosis or treats a case of VD is required to report such findings to the State Board of Health by name or by number, on a weekly basis, associated with the name of the physician requesting the examination. (Law available upon request from the Medical Society of Delaware.)

In 1970 legislation was also enacted to allow minors 12 years or over to give their written consent for treatment for contagious diseases (including venereal disease).

The New "Compromise" Restraint Standard

The Department of Transportation has recently issued a so-called compromise safety standard that calls for a complete "passive" restraint system on all passenger cars manufactured after August 15, 1975, to be attained in stages, with front seat protection called for after August 15, 1973. An abstract of the requirement follows:

1. Automobiles manufactured after January 1, 1972, must provide combination lap and shoulder belts *unless* manufacturers choose to meet the 1973 or 1975 requirements at this time.
2. Automobiles manufactured after August 15, 1973, must provide a "passive" system to prevent injury to front seat occupants in head-on crashes up to 30 mph. Lap belts are required *unless* the passive system provides protection in lateral collisions and roll-overs, as well as head-on crashes. (As generally understood, a "passive" system is one which requires no action on the part of the vehicle occupant. The "air bag" is one which has been publicized most widely, but there are others being considered, including blankets, nets, bolsters, pillows, etc. The above standard does *not* specify the type of system that must be used.)
3. Automobiles manufactured after August 15, 1975, must provide a "passive" system for all seating positions to prevent injury in crashes up to 30 mph, including lateral and roll-overs.

CHAMPUS Fee Schedule

The rigid fee schedule for medical services provided under CHAMPUS is being relaxed by new Defense Dept. regulations. A directive now in effect states that fees are to be based on reasonable, customary and prevailing charges in the locality for similar services. Approximately 6.5 million armed services and PHS retirees, in addition to dependents of active duty personnel, are eligible for medical and other health care benefits under CHAMPUS. Defense Dept. officials told the AMA that some physicians and medical societies have been under the erroneous impression that the CHAMPUS fee schedules established ceilings that could not be exceeded regardless of circumstances. These spokesmen said the government had no intention of depriving physicians and other providers of higher fees in cases involving complications. In such cases, they said, the physician should indicate on his claims form the medical reasons justifying charges exceeding the fee schedule.

CLINICAL NOTICES AND MEETINGS

Cellular Antigen Conference

Temple University School of Medicine will conduct the first international conference on cellular antigens at the Holiday Inn, Philadelphia, June 7-9. The meeting will consist of six sessions dealing with the chemical and immunological aspects of cellular antigens. Registrations may be made to Cellular Antigen Conference, Department of Microbiology, Temple University School of Medicine, 3400 N. Broad Street, Phila., 19140.

ACP Course

Th American College of Physicians presents *Internal Medicine: Clinical Problems 1971,* June 7-11, 1971, University of Cincinnati Medical Center, Cincinnati, Ohio. For information write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Phila., 19104.

Automation of Health Data

Area-Wide Automation of Health Data, a symposium in continuing medical education will be held June 3-5, 1971. For information write: Continuing Medical Education, Main Street Division, School of Medicine, State University of New York at Buffalo, 2211 Main Street, Buffalo, New York, 14214.

Rocky Mountain Cancer Conference

The 25th annual Rocky Mountain Cancer Conference will be held July 16-17, 1971 at the Brown Palace Hotel, Denver, Colorado. For information write: Rocky Mountain Cancer Conference, 1764 Gilpin Street, Denver, Colorado, 80218.

Health Care Delivery System

The Monroe County Medical Society, in observance of their 150th anniversary, with the co-sponsorship of St. John Fisher College, Rochester, New York, is presenting a symposium on *The American Health Care Delivery System* to be held June 11-13, 1971. Contact the Monroe County Medical Society, 1441 East Avenue, Rochester, 14610.

AMA Annual Meeting

A reminder that the 120th annual convention of the American Medical Association will be held June 20-24 at Atlantic City. See your bulletins for details.

Learning Disabilities Conference

A Conference on *Learning Disabilities* will be held by the American Association of Ophthalmology, in Atlantic City, June 19, 1971, immediately preceding the Annual Meeting of the American Medical Association. A multidisciplinary panel will discuss the various aspects of dyslexia and learning disabilities as they concern the educator, pediatrician, family physician, ophthalmologist, neurologist, otologist, psychiatrist and pediatric psychologist.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

GENERAL SURGEON: Board certified. Available July 1971 following completion of military service. Interested in partnership or solo practice.

GENERAL SURGEON: Available summer 1972 following completion of military obligation. Seeking Delaware opportunity.

Announcing

Physicians' Art Exhibit!

(also open to physicians' wives)

To be shown and judged during the 182nd annual meeting of the Medical Society of Delaware

DOVER DOWNS, DOVER, DELAWARE

OCTOBER 9, 1971

DEADLINE FOR ENTRIES: Notification of intent to exhibit must be received by September 1, 1971. (Early notification will be appreciated, so that proper facilities for the entire exhibit can be planned in advance. Mail your entry blank below as soon as possible.)

REQUIREMENTS: (1) All pictures must be framed with wire and screw eyes attached. (2) Works of sculpture must not exceed 36 inches in height and must be with appropriate base or pedestal. Because of limited exhibit space, these categories must be strictly adhered to. Decisions regarding category eligibility will be left to the discretion of the judges. (3) All entries must be delivered to the Diamond Lounge, Dover Downs, between 8 a.m. and 12:00 noon, on Tuesday, October 5, and must be picked up from the display area by noon Monday, October 11. No paintings will be removed from the exhibit before this time.

JUDGING AND AWARDS: Ribbons will be awarded by a panel of professional artists.
LIMITED LIABILITY: The Medical Society of Delaware will provide adequate protection from noon, October 5, to noon, October 11, but cannot assume responsibility for damage or theft of art submitted.

NOTIFICATION OF INTENT TO EXHIBIT

Mail to N. L. Cannon, M.D., Art Committee Chairman, Medical Society of Delaware,
1925 Lovering Avenue, Wilmington, Delaware, 19806 before September 1, 1971.

I plan to submit the following entries to the 1971 Art Exhibit. Three entries allowed per individual. Please circle classification of each.

1. .... oil, watercolor, sculpture, other
(title)

2. .... oil, watercolor, sculpture, other
(title)

3. .... oil, watercolor, sculpture, other
(title)

Name ....

Address ....

City & State .... Zip ....

Phone ....

THE FORUM

Environment And Health

THE PHYSICIAN AND AIR POLLUTION: II

Arthur R. VandePoele

The medical effects of air pollution are, unfortunately, too well known.

The London smog of 1952 was blamed for 4,000 deaths. In Donora, Pennsylvania, during a 25-day air pollution episode in 1948, 20 people died and more than 40 percent of the city's population became ill, some on the very first day of the smog. Donora's mortality and morbidity figures applied to a city the size of New York would result in more than 10,000 dead and more than 3,000,000 ill.

Greater Wilmington, of course, has not suffered from any comparable episode, but the area has been ranked by some authorities as high as fifteenth among the most polluted cities in the country. Especially since Wilmington's air quality is heavily influenced by sources outside the state, there remains the possibility of relatively serious air pollution episodes right here in Delaware.

The health-care community has a long-term responsibility to help reduce and ultimately eliminate that threat; but while it remains, the responsibility of the individual physician remains, as always, with his own patients, especially those whose age or state of health makes them particularly susceptible to the effects of excessive air pollution.

Wilmington's daily papers have begun to publish a daily air pollution index and pollution alerts. Those reports should become part of every physician's reading every day.

When the warning comes of an impending air pollution episode, there are several generally prudent steps the physician can take on behalf of his patients:

1. Advise patients to stay indoors, close their windows and use any air-purifying devices available.

2. Advise patients to avoid *indoor* pollution by not smoking and by staying out of rooms where others are smoking. They should also avoid activities that may raise dust, such as vacuuming, using a fireplace or starting up a hot-air furnace.

3. Avoid elective surgery, and treat early signs of illness promptly and aggressively.

Even more generally, since the coincidence of an air pollution episode and an influenza epidemic could be especially disastrous, physicians should see that chronically ill patients are immunized against the disease.

Finally—or really, first of all—the physician should thoroughly instruct his heart and respiratory patients in advance to watch for air pollution alerts, take their own preventive measures immediately, and call him at the first sign of illness.

The steadily increasing interest and education of the public in the dangers of air pollution promise a tomorrow with clearer skies and cleaner air. Meanwhile, the physician can make his first contribution in the fight against air pollution where it counts most, among his own patients.

Continued next month

Mr. VandePoele is Executive Director, Delaware Tuberculosis and Health Society.

This page is sponsored by the Delaware Tuberculosis and Health Society.

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DRUG STORES

Delaware
Medical Journal

JUNE, 1971
VOLUME 43
NUMBER 6

LONG-TERM INTRAVENOUS HYPERALIMENTATON

• **Intravenous hyperalimentation is the first technique of long-term total parenteral therapy which has allowed the physician to provide the patient with adequate nutrients to support normal growth and development in infants and positive nitrogen balance and lean tissue weight gain in adults. Expeditious application of this technique may reduce morbidity and mortality in patients in whom use of the gastrointestinal tract for feeding is inadequate, impractical, ill-advised, or impossible.**

Stanley J. Dudrick, M.D.
Terry R. Allen, M.D.

The establishment and maintenance of an adequate feeding program can be vital to the physician or surgeon in the management of a nutritionally deprived patient. Periods of relative or complete starvation often accompany the primary pathological process as a major feature of the patient's clinical course. If optimal results are to be obtained, restoration of the state of nutritional balance is desirable during all phases of diagnosis, therapy and convalescence. This can be accomplished with thoughtful attention to dietary regimens, individualized to the specific needs of the patient and delivered to the alimentary tract orally or by various feeding tubes whenever feasible. Frequently, however, use of the gastrointestinal tract is inadequate, ill-advised or precluded, and nourishment must be provided by the parenteral route.

At the University of Pennsylvania Medical Center the technique of total intravenous hyperalimentation, whereby nutrients are administered in amounts exceeding basal requirements by as much as 200% in order to maintain positive nitrogen balance, has proved valuable in supporting over 1000 malnourished patients for prolonged periods of time. Wound healing, weight gain, fistula closure, remissions of regional enteritis and ulcerative colitis, and increased strength, activity and feeling of well-being have been regularly observed in adults; and normal growth and development have been achieved in over 65 infants fed exclusively by vein. Patients with renal or liver failure have been supported adequately by intravenous feeding, when feeding via the alimentary tract aggravated their clinical courses. No longer is it necessary that

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Dr. Dudrick is Associate Professor of Surgery, University of Pennsylvania School of Medicine.
Dr. Allen is Instructor in Surgery, University of Pennsylvania School of Medicine.

This paper was originally presented to the Department of Surgery, WMC, February 6, 1971.

TABLE I. ADULT INTRAVENOUS HYPERALIMENTATION SOLUTION PREPARATION

Unit Preparation of Base Solution

	Bulk Method (Pharmacy)		*Single Unit Method (Ward or Pharmacy)*	
	165 gm Anhydrous Glucose U.S.P.+ 860 ml 5% Glucose in 5% Fibrin Hydrolysate		350 ml 50% Glucose + 750 ml 5% Glucose in 5% Fibrin Hydrolysate	
	Sterilization through 0.22 micron membrane filter under laminar-flow filtered-air hood		Aseptic mixing technique under laminar-flow filtered-air hood	
Volume	1000	ml	1100	ml
Calories	1000	Kcal	1000	Kcal
Glucose	208	gm	212	gm
Hydrolysates	43	gm	37	gm
Nitrogen	6.0	gm	5.25	gm
Sodium	8	mEq	7	mEq
Potassium	14	mEq	13	mEq

Additions to Each Unit of Base Solution
(Average Adult)

Sodium	(chloride) and/or bicarbonate	40 - 50 mEq
Potassium	(chloride) and/or bicarbonate	30 - 40 mEq
Magnesium	(sulfate)	4 - 8 Emq

Additions to Only One Unit Daily
(Average Adult)

Vitamin A	5000 - 10,000 U.S.P. units
Vitamin D	500 - 1000 U.S.P. units
Vitamin E	2.5 - 5.0 I.U.
Vitamin C	250 - 500 mg
Thiamine	25 - 50 mg
Riboflavin	5 - 10 mg
Pyridoxine	7.5 - 15 mg
Niacin	50 - 100 mg
Pantothenic Acid	12.5 - 25 mg

Optional Additions to One Unit (as indicated by serum studies)

Vitamin K	5 - 10 mg	Alternatively may be given intramuscularly in daily or weekly dosages.
Vitamin B_{12}	10 - 30 mcg	
Folic acid	0.5 - 1.5 mg	
Iron (dextriferron)	2.0 - 3.0 mg	
Calcium (gluconate)	4.5 - 9 mEq	
Phosphate (potassium acid salt)	4 - 10 mEq	

Micronutrients such as zinc, copper, manganese, cobalt and iodine are present as contaminants in hydrolysate solutions, but may be given in plasma transfusion once or twice weekly if desired.

* * *

patients be nutritionally deprived or starved to death because they cannot eat.

Principles of Intravenous Hyperalimentation

Patient Selection

After establishment of the need for intravenous feeding, careful evaluation of the cardiovascular, renal, hepatic, pancreatic and metabolic states must be performed. Because there is no known disease process in which a state of malnutrition is advantageous during attempts at specific therapy, the provision of optimal nutrition at all times is the minimal obligation of all physicians to all patients. However, the conditions and functional reserves of all organ systems must be accurately evaluated prior to formulating the nutrient regimen, be it alimentary or parenteral, if

TABLE II PEDIATRIC INTRAVENOUS HYPERALIMENTATION SOLUTION PREPARATION

Unit Preparation of Blue Solution

400 ml	5% Glucose in 5% Fibrin Hydrolysate	160 Kcal	20 gm Hydrolysates 20 gm Glucose
250 ml	50% Glucose	500 Kcal	
650 ml		660 Kcal	

Unit Preparation of Base Solution

Sodium	20 mEq	Sodium Chloride (2 mEq/ml)	10	ml
Potassium Phosphorus	25 mEq 25 mEq	Potassium Acid Phosphate (2 mEq/ml)	13	ml
Calcium	20 mEq	Calcium Gluconate 10% (0.45 mEq/ml)	44	ml
Magnesium	10 mEq	Magnesium Sulfate 50% (8 mEq/ml)	1.2	ml
Multiple Vitamin Infusion		(A, B — Complex, C, D, E)	4	ml
Vitamin K Vitamin B_{12} Folic Acid Iron		Added to solution daily or weekly or given intramuscularly	1	ml
Trace elements		Added to solution daily or given as 10 ml/kg plasma twice weekly	1	ml
			75	ml

BASE SOLUTION	650 ml	
ADDITIVES	75 ml	
FINAL SOLUTION	725 ml	(Given at rate of 145 ml/kg/day = 130 Kcal/kg/day)

* * *

optimal nutritional support is to be provided without further aggravating an already disordered metabolic balance.

Solution Preparation

The basic nutrient mixture is a hypertonic solution consisting of approximately 20% glucose, 5% protein hydrolysate, vitamins, sodium, potassium, calcium, phosphorus, magnesium and chloride. (Table I) It can be prepared in bulk from commercially available products by a manufacturing pharmacist or in individual units as needed by a specially trained floor nurse, technician or physician, using strict aseptic technique, preferably under a laminar flow, filtered air environment. Slight modifications of the formula (Table II) provide additional nutrients and trace elements necessary for growth in infants. (Table III)

Solution Administration

Starting at established levels of water metabolism (generally 2000-2500 ml in adults and 100 ml per kg in infants) and carbohydrate utilization (0.4 gm/kg/hr), daily infusion is gradually increased to levels of tolerance (up to 5000 ml in adults, 150 ml per kg in infants, and 1.2 gm glucose per kg/hr). To achieve maximum metabolic efficiency and assimilation of the nutrients, constant 24-hour infusion is necessary. Daily determinations of body weight and fluid balance, fractional urine sugar four times a day, and regular

TABLE III DAILY AVERAGE PEDIATRIC NUTRITIONAL REQUIREMENTS

	Oral Recommendations		*Intravenous Dose*		
Protein	2.5	gm/kg	4	gm/kg	
Calories	115	Kcal/kg	125	Kcal/kg	
Water	150	ml/kg	125	ml/kg	
Sodium	46	mg/kg	100	mg/kg	(4-5 mEq)
Potassium	58	mg/kg	156-195	mg/kg	(4-5 mEq)
Chloride	150	mg/kg	150	mg/kg	(4 mEq)
Calcium	218	mg/kg	72	mg/kg	(3-4 mEq)
Phosphorus	218	mg/kg	58	mg/kg	(5-6 mEq)
Magnesium	60	mg/kg	25	mg/kg	(2 mEq)
Iron	6	mg/kg	0.02	mg/kg	
Copper	0.07	mg/kg	0.022	mg/kg	
Cobalt	———	———	0.014	mg/kg	
Manganese	0.2	mg/kg	0.04	mg/kg	
Zinc	0.3	mg/kg	0.04	mg/kg	
Iodine	0.07	mg/kg	0.015	mg/kg	
Vitamin A	1,500	I.U.	3,000-4,000	I.U.	
Thiamine	0.4	mg	15-20	mg	
Riboflavin	0.5	mg	3-4	mg	
Pyridoxine	0.25	mg	4.5-6	mg	
Vitamin C	30	mg	150-200	mg	
Vitamin D	400	I.U.	300-400	I.U.	
Vitamin E	———	———	1.5-2	I.U.	
Niacin	6	mg	30-40	mg	
Pantothenic Acid	———	———	7.5-10	mg	
Vitamin K	1.5	mg	1-1.5	mg	
Folic Acid	0.35	mg	0.5	mg	
Vitamin B_{12}	1	mcg	1	mcg	

* * *

determinations of serum electrolytes, blood urea nitrogen and blood sugar are necessary for safe long-term administration. Baseline determinations of the serum calcium, phosphorus, magnesium and proteins should be repeated every one to three weeks during therapy as indicated in order to avoid or correct imbalances. Infusion pumps with 0.22 micron membrane filters are not absolutely essential, but can be valuable in maintaining continuous flow and sterility of the solution without danger of air embolism.

Infusion Catheter

Because the solution is hypertonic (1800-2200 milliosmoles), it must be delivered continuously into a large diameter, high blood flow vessel. Preferably, a catheter is inserted percutaneously into a subclavian vein and threaded into the mid-superior vena cava, using strict aseptic techniques. In infants under 10 pounds, a small vinyl or silastic catheter is inserted into the vena cava by cut-down over an external or internal jugular vein. Three times a week the dressing is removed, and the skin is defatted with acetone or ether and prepared with 2% iodine or thimerosal tincture. Antibiotic ointment is applied around the catheter exit site, and a new sterile dressing is applied. When these measures are conscientiously applied, catheters can be maintained safely in infants and adults for an average duration of 30 days, with individual catheters lasting as long as 90 days without evidence of infection.

Special Solutions

In the presence of hepatic or renal decompensation, special solutions of the eight essential L-amino acids can be safely infused together with hypertonic glucose in concentrations as high as 70% to the nutritional benefit of the patient, even in the presence of anuria and elevated blood urea nitrogen or blood ammonia. The high biologic value nitrogen in these mixtures can actually promote positive nitrogen balance and help clear the blood of excessive nitrogenous metabolites by incorporating the nitrogen of the urea or ammonia into protein and lean tissue synthesis.

Patient Management

Periodic adjustment of water, glucose, nitrogen, or electrolyte administration may be required during the clinical course of the critically ill patient. Relative glucose intolerance may occur at the beginning of intravenous nutritional therapy, during surgery, in the immediate postoperative period, following trauma, in premature infants, in the aged, or in the presence of diabetes mellitus or sepsis. To avoid persistent glucosuria with secondary osmotic diuresis and hyperosmolar dehydration, the glucose is infused at a rate which will not allow quantitative urine glucose to exceed 1%, ie, less than 3+ glucosuria. The glucose administered is gradually increased as the normal pancreas increases the output of endogenous insulin in response to the carbohydrate infusion. In patients with diabetes mellitus, crystalline insulin is given in evenly divided doses subcutaneously or in the intravenous fluid. Supplemental crystalline insulin is sometimes added to the nutrient solution in amounts of 5 to 25 units/1000 calories to encourage more rapid and efficient glucose utilization and positive nitrogen balance in elderly patients with borderline glucose tolerance, patients with pancreatic disorders, and in critically ill, nutritionally depleted patients in whom the prompt achievement of positive caloric and nitrogen balance is deemed urgent for survival.

Careful attention to potassium administration is essential to achieve positive nitrogen and potassium balance and restoration of depleted intracellular stores while maintaining a normal serum potassium level.

The usual daily peripheral intravenous dosage of 40 to 60 mEq of potassium is generally insufficient to maintain normal serum levels with the accelerated intracellular movement of this cation associated with anabolism. The obligatory daily excretion of potassium in the urine in the usual patient receiving isotonic intravenous fluids approximates 40 to 60 mEq, and this loss may be increased with additional stress. Not only is it necessary to replace this obligatory loss, but increased intake of potassium is essential to achieve weight gain and protein synthesis. Therefore, in order to maintain adequate serum levels and the normal potassium: nitrogen ratio (2.4-3.5:1) required for tissue synthesis, potassium must be administered in larger doses than with routine intravenous therapy. Usually 40 mEq potassium chloride is needed for each 1000 calories, and at times patients with large losses from the gastrointestinal tract or extensively burned skin may require more than 250 mEq potassium per day. In the presence of varying degrees of renal, cardiac or hepatic failure, vigilance must be maintained in the daily observance of serum values, urine output, and quantities of potassium administered to prevent serious complications of hypo- or hyperkalemia.

Fifty mEq of sodium per 1000 calories is usually given, either completely as the chloride salt or as two-thirds sodium chloride and one-third sodium bicarbonate. Adjustments in the amount and form of sodium administered are sometimes necessary. Compromised function of the heart, liver or kidneys may dictate significant reduction or even total restriction of sodium in the intravenous ration for varying periods of time. In patients with hypoalbuminemia, 12.5 to 25 gm of albumin is sometimes given to restore colloid osmotic pressure rapidly while supplementing nutrition. In the vast majority of patients, however, serum albumin will increase sufficiently with the judicious administration of the nutrient solution alone.

Infection or Sepsis

Prevention of infection is of utmost importance to the success of total intravenous feeding. The incidence of catheter sepsis is minimal if the principles of insertion and maintenance of the catheter are diligently observed. As the solutions are excellent culture media for many species of bacteria and fungi, meticulous asepsis must be maintained in solution preparation, additive insertion, and long-term intravenous administration. Should fever occur without obvious cause, the infusate and intravenous tubing are replaced, and cultures of the blood and fluid obtained. If the fever persists, infusion is terminated, the catheter is removed, and its tip cultured. Broad spectrum antibiotic therapy is seldom required, but may be instituted at this time as desired or indicated.

Hyperosmolar Nonketotic Hyperglycemia

The acute form of this syndrome can occur with too rapid infusion of the hypertonic fluid with resulting osmotic diuresis, dehydration, central nervous system irritability, and convulsion. The chronic form can occur when glucose metabolism is impaired, particularly with diabetes, burns, trauma and neurosurgery. If blood and urine sugar are not carefully monitored, blood sugar becomes elevated and the patient becomes weak and listless and eventually comatose. Prompt treatment of both forms of hyperglycemia consists of judicious infusion of isotonic saline or glucose solutions with insulin while serially determining fluid balance, central venous pressure, electrolytes and blood sugar.

Experimental Considerations

Intravenous hyperalimentation allows adequate nutrition in animals and man for prolonged periods during which the gastrointestinal tract can be placed at rest or studied without the necessity of creating abnormal pouches, loops or other devices. The gastrointestinal tract need not be used for feeding while it is being studied, with maintenance of absolute control over the quantity and quality of nutrients delivered. The role of the various nutrients in influencing the various gastrointestinal secretions and general body metabolism can probably be more easily appreciated using this technique than any other heretofore available. The opportunities for studying the effects of individual nutrients upon the course of a disease process, have never been so easily available for so long a time in such a finite fashion as with long-term total intravenous nutrition.

The technique of intravenous hyperalimentation allows adequate metabolic and nutritional support of patients with severe nutritional debility or prolonged disability of the alimentary tract, and can be a valuable tool in the repertoire of the physician and investigator.

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Books are tools, doctors are craftsmen, and so truly as one can measure the development of any particular handicraft by the variety and complexity of its tools, so we have no better means of judging the intelligence of a profession than by its general colection of books.

By William Osler; from Dick Durham's Notebook.

CYTOMEGALOVIRUS MONONUCLEOSIS

• **Fever, hepatosplenomegaly and lymphocytosis suggest a diagnosis of infectious mononucleosis. When there is no rise in heterophil antibody, little or no lymphadenopathy and no pharyngitis, consider the diagnosis of cytomegalovirus mononucleosis.**

Gerald L. Mandell, M.D.

Two patients were seen at the University of Virginia Medical Center in the past year with a puzzling illness characterized by fever and hepatosplenomegaly. Both of these patients were adult males; neither had had contact with blood or blood products. Serologic studies suggested the diagnosis of cytomegalovirus (CMV) mononucleosis. This paper will describe these patients and discuss the various manifestations of cytomegalovirus infection.

Cese Reports

The first patient, a 47-year-old man, presented with fever and sinusitis. He also had hepatosplenomegaly and was noted over several days to develop a 65% lymphocytosis. CMV antibody studies were compatible with an acute cytomegalovirus infection.

The second patient, a 26-year-old man, presented with fever, backache, hepatosplenomegaly and lymphocytosis. CMV antibody titers were diagnostic of recent infection with this virus.

Discussion

The cytomegalovirus is a member of the herpes virus group which includes herpes simplex, herpes zoster (varicella), and EB virus. These viruses are medium large, slightly less than 100 millimicrons in diameter, and contain a DNA nucleic acid core, a surrounding protein coat, and an outer covering, or envelope, which is derived from the cell membrane of the infected cell.

CMV, as well as herpes simplex and herpes zoster viruses, can be grown in fibroblastic cells of human origin. Human embryonic lung fibroblasts, WI-38, and human fetal skin and muscle cells have been used to isolate and study these viruses. The EB virus (the agent implicated in infectious mononucleosis) has not been isolated and passed in tissue culture at the present time. In contrast, CMV can be passed in the supernate from infected cells, but this is accomplished better with the cell associated portion of the harvest. Within 72 hours after infection with CMV, cells show the cytopathic effect of the virus as well as intracytoplasmic and intranuclear inclusion bodies.

Both complement fixing and neutralizing antibodies are produced by the host during infection with the CMV. Unlike many virus infections in which complement fixing (CF) antibody is transient, falling to low or undetectable levels after an acute infection, complement fixing antibody to the herpes group tends to persist for long periods of time. CF antibody to this virus is found in from 30 to 70% of newborn children. The level of antibody then falls during the first year of life, as is the case with other maternally derived antibodies. Antibody prevalence then increases year by year so that 50 to 80% of persons over thirty-five years of age have demonstrable complement fixing antibody to the virus.[1]

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This paper was originally presented at the Delaware, District of Columbia, Maryland and Virginia regions of the American College of Physicians meeting in Williamsburg, Virginia, November 20, 1970.

Disease due to CMV may manifest in several different ways. The classic picture of CMV disease in newborns is an acute, often fatal disease wth hepatosplenomegaly, hemolytic anemia, jaundice, thrombocytopenic purpura and CNS damage. In children under the age of four who survive the acute illness, there may be chronic excretion of the virus in the saliva and urine. CMV infection of newborns is not rare, since 6% of mothers are infected during pregnancy, and 1 to 2% of their babies may be affected.

CMV disease is also seen in patients with impaired host defenses. These include transplant patients, patients on large doses of steroids, and patients with leukemia or lymphomas. The syndrome of high temperature, cough, vomiting, diarrhea, hepatosplenomegaly, jaundice and pneumonia has been described in leukemic children infected with CMV. In a study of transplant patients, CMV was isolated from most patients if they had evidence of prior infection with the virus, and isolated from 50% of patients who had no prior evidence of infection.[2] The assumption was thus made that much of the viral infection seen after immunosuppression was due to activation of latent virus.

The third clinical situation in which cytomegalovirus commonly causes disease is in the patient who has received blood transfusions.[3-5] The CMV is found in the erythrocyte, leukocyte and plasma fractions of blood. Although fresh blood has been most commonly implicated, studies have demonstrated that the virus can persist for 28 days in stored blood. In studies of patients undergoing cardiopulmonary bypass, most of those receiving large amounts of fresh blood show serologic evidence of CMV infection. A smaller number show evidence of clinical disease. The syndrome of postperfusion mononucleosis has now been shown to be due to infection with CMV. This is manifested by fever for three to six weeks and a mononucleosis-like blood picture.

The fourth situation, and the one which our two patients represent, is the mononucleosis-like illness due to CMV, unrelated to blood transfusion.[1,6-8] This syndrome may present as an illness very similar to that which we call infectious mononucleosis, the latter illness probably being caused by the EB virus. CMV mononucleosis is somewhat different, however, in that exudative pharyngitis is usually not seen and lymph node enlargement is absent or minimal. The hematologic picture with lymphocytosis and atypical lymphocytes is identical to that seen with infectious mononucleosis.

Several Finnish investigators have been aware of the CMV mononucleosis problem for some time. In a large series of cases, 9% of all patients presenting with the infectious mononucleosis syndrome were found to have serologic or cultural evidence of recent CMV infection. Also, this group found that about half of their patients with the infectious mononucleosis syndrome that had negative heterophil studies had evidence of recent CMV infection. Serum from patients with CMV mononucleosis usually does not contain significant amounts of heterophil antibody. Hepatic involvement is common with CMV infection as it is with infectious mononucleosis, and the complications of polyneuritis, pericarditis and myocarditis have been described in both. In some cases intranuclear inclusion-bearing cells may be seen in the urine. This finding is more common, however, in patients who have impaired host defenses.

Conclusion

CMV mononucleosis should be suspected when the clinical syndrome suggests infectious mononucleosis, but heterophil antibody is absent. The CMV mononucleosis syndrome is variable, but is nearly always benign and self-limited.

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Highlights

ULTRASOUND AS AN AID IN THE DIAGNOSIS AND TREATMENT OF INTERMITTENT CLAUDICATION

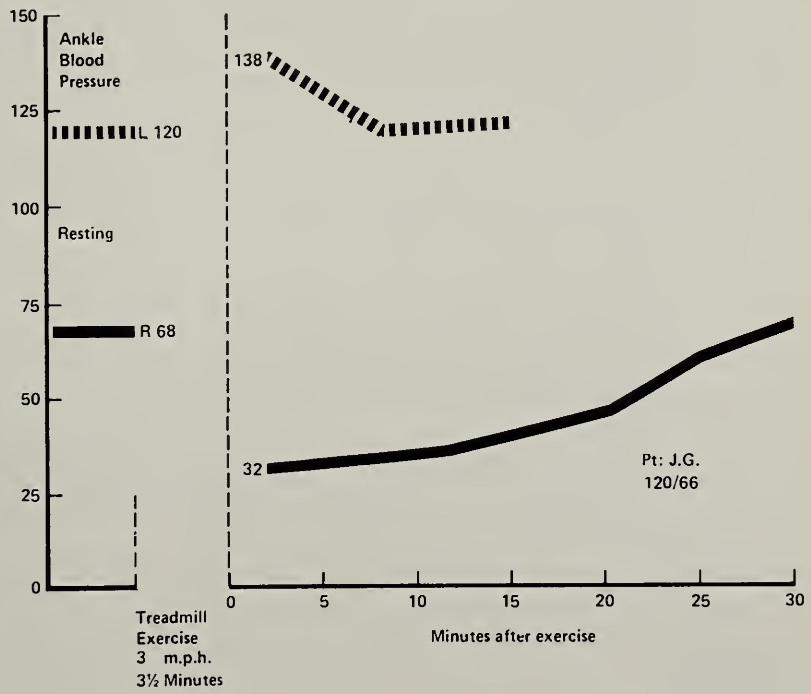
Richard Lennihan, Jr., M.D. and Martha Mackereth, R.N.; *Presented to the Annual Meeting of the American College of Angiology, Las Vegas, Nevada, October 1969 and abstracted from the December 1970 issue of Angiology.*

Objective information has been difficult to obtain in intermittent claudication as symptoms emerge only during exercise, but the patient is examined when he is at rest and free of pain. Further, the onset of claudication depends on the speed, distance and elevation of walking.

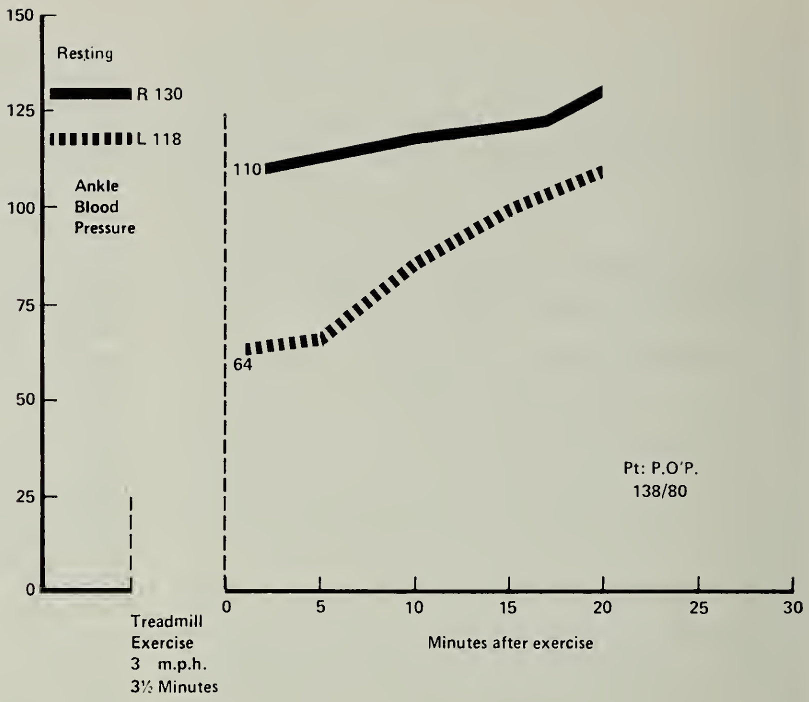
How reliable is the report of a one- or two-block walking tolerance? In Wilmington a block ranges from 150 to 500 feet and 0°-17° incline. Should a physician include an evaluation of the good leg in his recommendations for treatment of unilateral intermittent claudication? If so, what techniques are available for a functional evaluation of the good leg? Assuming most claudication arises from atherosclerosis as a progressive ailment, when in the natural history of the disease should arteriograms be done? Early or late? Can electronic techniques help us select and follow the postoperative patient for better understanding of success and failure?

These and other questions require an objective test as an aid in evaluation and management of intermittent claudication. Dr. Eugene Strandness ignited our interest in this work based on his extraordinary experience in functional testing of vascular patients at Seattle. His illuminating book, *Collateral Circulation in Clinical Surgery*, stands alone as bountiful reference for the interested reader.

We have obtained valuable information



Patient with claudication of recent onset. Note fall in right ankle pressure with recovery in 30 minutes.



Patient with symptoms in left leg only, bilateral disease revealed by testing.

about patients with intermittent claudication by using a simple walking test that affords a functional view of vascular insufficiency. It is an accurate, reproducible procedure suitable for office or community hospital and easily carried out by a nurse or technician. This paper describes our experience.

Physiology of Ankle Blood Pressure Changes in Intermittent Claudication

Leg muscles demand an enormous increase in blood supply on changing from resting to walking. Normal vessels easily accommodate this need whereas a narrow or occluded artery cannot. Here the exercising muscles "steal" available blood at the expense of the foot and ankle, and consequently ankle pressure fails during exercise.

Since the Doppler ultrasound flow detector readily perceives circulation in vessels not palpable, the instrument can monitor the dorsalis or posterior tibial arteries in the patient with a proximal occlusion.

A functional test for intermittent claudication now becomes possible using the Doppler to record pressures before and after exercise. The resting pressure, amount of fall induced by walking, and time required to regain resting levels are component indices of arterial insufficiency.

We record resting ankle pressures with the Doppler*; then the patient walks at his usual speed on a treadmill.** The patient reports the onset, location, and severity of leg pain while the examiner watches for shortness of breath or other signs of exertional distress. The patient stops when he would normally give in to his leg pain. The speed and duration of the walk are recorded while he quickly reclines.

A person with normal arteries can obviously walk three-four m.p.h. on level ground for long stretches without any sign of claudication. Pulse and blood pressure may rise slightly, and with this, ankle pressure goes up and quickly returns to resting levels after cessation of exercise. Alteration of this expected pattern was shown by presentation of several cases.

In patients with claudication of recent onset, objective testing may demonstrate the remarkable inaccuracy in the patient's judgment of his own walking tolerance. In patients with established claudication with good collaterals, there may be a quick recovery time, but the test will uncover predictable trouble in the asymptomatic leg.

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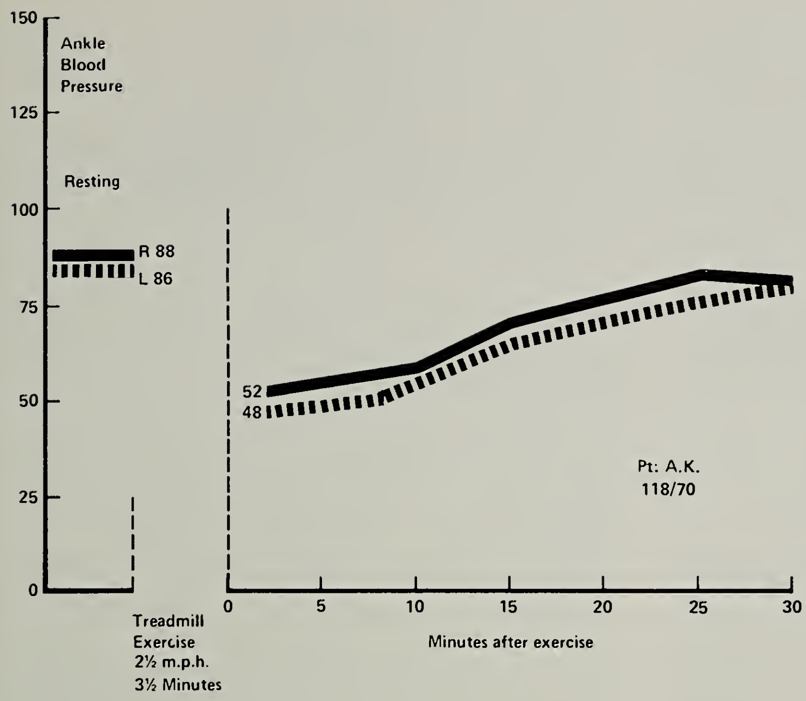
*Parks Electronic Lab, Beaverton, Oregon. Doppler Model 802.

**Quinton Instruments, Seattle, Washington. Treadmill Model 14-44-A.



Objective information of functional insufficiency in a patient with poor ability to give a helpful history.

Preoperative evaluation may delineate important arterial disease in the patient's "good" leg so that preoperative discussion between the patient and his physician can be based on realistic expectations of the surgical improvement expectable. When the patient is a poor historian and cannot provide a good history, objective information can aid sound management; the electronic testing can provide reassurance based on objective observations.

Unsuspected cardio-pulmonary problems may become obvious only during direct observation as the patient walks on the treadmill.

Exercise testing can also provide the physician with confidence in turning from arterial insufficiency to joint pathology as a principal cause for distress. We believe this test can be helpful to many physicians.

This work was supported in part by a grant-in-aid from the Delaware Heart Association.

⁂

NOT EVEN HIS DOCTOR —

A hundred physicians and medical students at Duke University were recently studied with respect to determining their attitudes towards treating fat people.[1] The study revealed that a majority of both the doctors and doctors-to-be were equal in their attitudes towards the obese, who were distinctly *not* preferred as patients. Why? "The imputed etiology of overweight stresses social and emotional factors which are not preferred by physicians generally and which generate in the physician an attitude of hopelessness."

In other, older and less fancy words, nobody, not even most doctors, loves a fat man. But how elegantly is their paper titled!

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Special Reports

HEALTH NEEDS OF CHILDREN IN DELAWARE: A REPORT PREPARED FOR THE WHITE HOUSE CONFERENCE ON CHILDREN

Washington, D. C., December 13-18, 1970

Introduction

There has been an increasing awareness throughout our country that there are many children not receiving adequate health care. As a result, there has developed a demand on the part of the general populace which is exceeding the capacity of the physicians and allied health workers to meet. The philosophy that "good health is a basic human right" has made it imperative that those involved in the delivery of health care examine their methods, their objectives, and their own philosophy. With the rising population, spiralling costs, and a manpower pool unable to keep up with the demands, the delivery of good health care to everyone has become a huge problem. Hopefully, with some imaginative planning and restructuring of the health team and its mechanism of delivery, we will be able to solve some of the problems facing us during the coming decade.

As the manpower pool decreases relative to the demand, and as costs rise, many people are becoming more and more geared to "crisis care," usually delivered in the emergency room of a hospital by a strange doctor, who has never seen the sick child before, and may never see him again.

Those unable to afford a private doctor are beginning to demand more than just "crisis care," and rightfully so. Ideally, every child should have his own physician, who examines him at birth and at regular intervals during his life, and cares for him when he is sick. However, it is impossible for everyone to receive the same high quality care of the fortunate few, primarily because of the shortage of physicians, even if funds were made available through public sources.

Thus, it is necessary for us to examine other methods of meeting the health needs of children, so that *all* children can benefit from the total resources available in our State.

What is needed in Delaware to improve the quality and quantity of health care to children?

In the area of physical health, the primary need is in the area of prevention, since this is not only the most humane, but also the most economical approach toward improvement of child health.

To improve nutrition, we need a good educational program aimed at both parents and children. This type of education requires skilled and imaginative teachers, since it is well known how difficult it is to change the eating habits of people who are long accustomed to traditional family patterns of food buying and food preparation. Nevertheless, it is felt that through school programs aimed at children, after-school programs for parents, especially the one who buys and prepares the food, and through the newspapers, radio and television, such education may help a large number of our children who are suffering from malnutrition due to ignorance and/or poverty.

Although nutrition should be the primary thrust of such an educational process, through the same channels families could learn more about other preventive health measures, such as attending well-baby clinics, getting immunizations, accident prevention, etc.

Such educational channels should also give information about the Delaware League for Planned Parenthood and its many clinics and services. Clearly the health, both physical and mental, of any individual child depends a great deal on his being wanted and loved. Information on the availability and safety of contraceptive devices and medications needs more widespread dissemination at all levels of our community. We should encourage too frank discussion on the availability and cost of abortion in Delaware, since the recent passage of the liberalized abortion act will undoubtedly increase demand.

At the present time delivery of health care falls largely into two categories: "crisis care" and "optimum care." There is, however, another category spanning these two extremes. In the area of physical health, a number of well-baby clinics, under the direction of the Division of Physical Health, Department of Health and Social Services, are conducted in all three counties, offering routine physical examination, immunizations, and some anticipatory guidance in nutrition, growth and development.

It is estimated, however, that only 50% of Delaware's children receive their basic immunizations prior to entering school. Since Delaware has no laws requiring immunizations prior to entrance into first grade, many children thus enter school having had no prior medical supervision.

There is need for better structuring of our well-baby clinics and more involvement of para-medical professionals, such as pediatric nurse practitioners, nutritionists, psychologists, social workers, etc. More clinics are needed, particularly in the downstate areas. Transportation to and from clinics would increase attendance, as would baby-sitting services and more adequate publicity of clinic times and locations. More clinics for the high-risk infant should be held, separate from the routine well-baby clinics. Greater cooperation between the Wilmington Medical Center and the Division of Physical Health should be encouraged to provide more physicians to man well-baby clinics, giving better physician coverage for clinics, at no added cost, and providing an excellent teaching opportunity to interns and residents in Pediatrics. Nurses-in-training as well as other health professionals, who could give service and learn simultaneously, should also be encouraged to assist in well-baby clinics.

In view of the fact that states with laws requiring certain immunizations prior to entry into first grade show a marked and significant decline in those diseases (eg, measles), we recommend that such legislation be introduced into the Delaware Code.

By improving our well-baby clinics and making certain shots mandatory, a program to immunize school children should be largely limited to giving of booster shots. It is urged that better records be kept, and reporting to a central agency, such as the Division of Physical Health, be made mandatory whenever booster shots are given. Using a computer for storage and easy retrieval of such data would appear to be the most efficient and economical way to solve the problem of recording immunizations of Delaware children, and prevent unnecessary repetition of shots which could cause illness in a child.

The problem of early detection of illness will be solved in part by these restructured well-baby clinics, where good parent counseling, screening tests, and appropriate consultation would be available.

In *New Castle County*, the acutely ill child without a private physician may go to emergency wards of three hospitals or the Pediatric Clinic of the Wilmington Medical Center. These facilities are well staffed by physicians and doctors in training. Problems do exist regarding inadequate space, little privacy, long waiting periods, and "herding" of patients. These problems are being worked on constantly, and hopefully they will be resolved through the continued efforts of the Medical Center and the Pediatric Staff.

Three neighborhood clinics have opened during the past year, two supported by the Division of Physical Health (Middletown and Northeast Clinics) and one privately funded (Southbridge Clinic). Except for Southbridge, these clinics are not set up to handle the acutely ill child in the neighborhoods they serve.

In *Kent* and *Sussex Counties*, no outpatient clinics are available in hospitals or neighborhood clinics.

In *New Castle County,* the Delaware Division of the Wilmington Medical Center and St. Francis Hospital admit children who are acutely ill and require hospitalization. Although the Wilmington Medical Center is well equipped and well staffed for care of children, it is in serious financial difficulty and is seeking public funds to help support its services to indigent patients. Plans for expansion, relocation, and/or modernization of present facilities have been seriously hampered by conflicting opinions and red tape. Apparently, the St. Francis Hospital is waiting for the decision of the Wilmington Medical Center before expanding its services.

In *Kent* and *Sussex Counties* hospital care for the acutely ill child is adequate. Although pediatricians give their services to care for indigent children as well as private patients, they have no supporting help from residents, interns, or house officers.

Thus, Delaware's deficiencies in the areas of acute and chronic illness of children appear to lie largely in the lower counties. There, the paucity of doctors makes the delivery of care a difficult problem. We suggest that internship and residency programs be developed in downstate hospitals to help relieve the physician shortage as a short-term goal, with the hope that some of these young men and women may remain to practice as a long-range objective.

Delaware is fortunate in the area of the handicapped child as far as diagnosis and therapy are concerned, through the association of the Nemours Foundation and the Division of Physical Health. The handicapped child in need of residential care is not as fortunate. There are plans for the development of a long-term care center for children with multiple handicaps through a private organization, L.T.C., Incorporated. Several handicapped adolescents are presently being housed at the Smyrna Home and Hospital. Surprisingly it has given the children a great deal of love from older patients, who are, in turn, developing a new interest in life through their association with the young people, sort of an accidental foster grandparent relationship.

There is no residential care for chronically ill children in the state of Delaware. A limited number of children may go to the Seashore House in Atlantic City for long-term care and rehabilitation. Most chronically ill children, such as those with rheumatic fever, rheumatoid arthritis, and nephrosis, are presently retained in acute care facilities. Hospital beds are scarce and expensive, and the special needs of such children in areas of education, rehabilitation, and psychological adjustment are not adequately met in a hospital setting. We recommend that residential care for chronically ill children be considered by some group, private and/or public, as a top priority need for Delaware children.

In the area of mental health, Delaware offers little in the way of education to parents in meeting the emotional needs of children. Some psychiatrists from the Division of Mental Health are participating in the "Expectant Parents Counseling Session" at the Wilmington Medical Center. The Division of Physical Health also sends literature to parents of infants whose birth notices appear in local newspapers.

Early detection of mental illness is an area receiving much attention recently through the efforts of Priscilla A. Keeler, M.D., Director of the Terry Children's Psychiatric Center, and a group of AAUW women, who recently completed a study of the Abused and Neglected Child in Delaware entitled "Where Do Children Go?"

The acutely ill child in need of psychiatric care may receive services through Mental Hygiene Clinics, Division of Mental Health, Department of Health and Social Services. In New Castle County, the Wilmington Child Guidance Center serves a small number of children by a team approach. No such services are available in the lower counties.

The adolescent with acute mental illness has no place to go other than the State Hospital at Farnhurst, where he may be put in with adult patients. The less disturbed child, in need of residential care for reasons other than his own illness, such as a poor home situation or an inadequate guardian, may stay in the Governor Bacon Home, the Children's Home, or the Boys' Home of Delaware. Unfortunately some children are placed in detention homes such as Bridge House, Ferris School or Woods Haven-Kruse School, when there is no other space available.

Children with chronic or serious mental illness are well cared for in Delaware. The Hospital for Mentally Retarded at Stockley is a model for other states. Similarly, the Terry Children's Psychiatric Center is not only a modern new facility, but the staff is well trained in the latest methods of management of the seriously disturbed child.

Those working in the field of mental health feel that the most pressing need is for outpatient services for children. Some favor combining the Child Diagnostic and Development Center with the Child Guidance Clinic since their services overlap, and a more efficient program could be developed if their services were meshed. All our consultants agree that Delaware needs more child psychiatrists, and if we could develop a good clinic in Wilmington, it might attract child psychiatrists to our area and serve as a model for similar clinics in the lower counties.

Until Delaware state agency salaries measure up to those offered by other states, we cannot hope to obtain the badly needed and scarce professionals in our Mental Hygiene Clinics and other clinics serving children in Delaware. There is need for caseworkers assigned to Protective Services to receive further training in the psychiatric implications of family problems. Those presently employed, in addition to being underpaid and overworked, are not well informed on what emotional deprivation means to children and the importance of their emotional needs and their gratification. Probably more than anyone else in the state, they have contact with the most disadvantaged and needy families whom they serve.

We recommend that these adjustments be made and the Mental Hygiene Clinics hold special clinics for children, using personnel specifically trained in child psychology, namely, a child psychiatrist, a psychologist, and a social worker. This team could utilize paraprofessional people to aid them, such as school guidance counselors, teachers, recreation workers, neighborhood aides, and clergymen. Some of these aides such as clergymen and guidance counselors might already have developed the necessary skills. Others, the teachers and neighborhood workers, would have to be selected carefully and further trained by the health team.

What does Delaware have in educational programs to provide on-going personnel to deliver primary health care?

Delaware has no medical or dental school. An agreement between Jefferson Medical School, the University of Delaware, and the Wilmington Medical Center has been made, with funds for research and development appropriated from the State Legislature. The purpose of this affiliation is primarily to attract more physicians to Delaware, to improve the education of our house staff at the Wilmington Medical Center, and to prevent the tremendous expenditure of state funds which would be needed to develop a medical-dental school in the state. Ultimately, it is hoped that this institute will provide the resources for medical research, teaching and service to the people of the entire state of Delaware. The monetary incentive to Delaware residents to attend medical school in Philadelphia and return to Delaware for postdoctoral training and practice is felt by some to be inadequate, particularly for low-income families. Unless higher scholarships are awarded to such students, we will continue to lack a substantial number of black physicians and doctors representing other minority groups.

In the area of the nursing professions, several programs exist throughout the state which lead to the LPN and RN degrees. An Associate of Science Degree in nursing is offered at Wesley College, and a bachelor's degree is offered by the University of Delaware. The advanced training programs in nursing at this university, leading to a master's degree, are directed toward academic fields and highly specialized in-hospital nursing techniques, and graduate only a few clinically oriented nurses to work in our state each year.

There is no school of social work in Delaware.

The University of Delaware has an excellent home economics department with a program of study for those interested in nutrition and child development.

Although the University of Delaware has a good Department of Psychology, there is little or no opportunity in the curriculum for those interested in training for positions in clinical psychology.

Opportunities for training in occupational therapy and physiotherapy exist in Delaware colleges under Departments of Education or Physical Education.

The Wilmington Medical Center and Delaware Technical and Community College offer courses in medical technology which are considered to be of excellent caliber.

Education for associates and aides is good in some fields, poor or non-existent in others. The physician's assistant, a new concept in the health field, is not being trained in Delaware, nor, for that matter, could he work in our state until some legislation is passed to legalize this type of person and protect him and his employer from malpractice suits.

There are few programs designed to interest young people in health careers. One of excellent caliber in New Castle County is the Health Manpower Summer Experience Program, sponsored by the Association of Delaware Hospitals, Inc.

Thus, in the area of education, it has been pointed out that Delaware does not train social workers or clinical psychologists. Nor is there a training program for Nurse Practitioners in Pediatrics or other specialties. We recommend that the University of Delaware, which has the faculty and resources for developing these types of educational programs, be encouraged to contribute to our health manpower pool by turning out more clinically oriented graduates. Hopefully, by the time such people are trained, suitable jobs will be ready and waiting for them through proper planning along the lines of the health team concept.

Furthermore, health education should be introduced into the classrooms from kindergarten through grade twelve. During the high school years training in health crafts should be offered. We recommend such programs be developed at the secondary school level and be continued in our junior and four-year colleges.

Educational programs for parents should be developed in schools, as part of the community school program, in community centers, in churches, and through the mass media.

Another opportunity for education of parents exists in our day care centers, which we anticipate will grow in quantity and, hopefully, quality during the coming decade. These centers can serve as a laboratory for mothers and students to learn some of the fundamentals in child care, growth and development. Here too they can observe well-trained child specialists handling children and can learn certain techniques of child management and the learning process in children.

The area of a healthful environment, although intimately tied in with good health, is one we feel to be outside our realm. However, we wish to emphasize the basic importance of good housing, good water, good food, etc., for good health, for without these basic needs all our efforts to improve the health of children would be "like putting a band-aid on a major surgical wound."

Mode of Attack

On reviewing the recommendations that have resulted from this study, the greatest needs apparently fall into four categories: planning, including establishment of priorities, money, manpower, and legislation.

A. Planning

We need further study and evaluation of already existing programs and agencies. For example, we did not delve into problems such as medical care of the institutionalized child, the child of migrant farm workers, and other special groups of children. Broad problems, like lead paint poisoning and genetic diseases, such as sickle cell anemia, which affect the lives of many of our children need to be stucific areas. We feel that already existing study groups, such as the AAUW and YWCA, could be organized to attack these problems, gather data, and make recommendations.

Results of various studies should be turned over to a central planning group for evaluation, implementation, and establishment of priorities. The Council on Children and Youth might be the best central committee for the job of sorting and planning. Hopefully, the Council will be expanded to include some members primarily interested in the health aspects of children. We recommend representatives from the State Medical Society, the American Academy of Pediatrics, the Department of Health and Social Services, the University of Delaware Department of Nursing, and others.

B. Money

We feel the climate for receiving funds from federal sources is good at the present time since the present administration has indicated that children under the age of five years, will receive priority when it comes to health dollars. Let us take full advantage of this opportunity and tap federal sources for funds wherever possible in our planning. This will require expert consultation, which we hope our state will provide, since most federal funds come as "matching money."

To receive state appropriations we need to have sound programs, well thought out, and we need to help our legislators to determine priorities in the health field. Thus we should approach our state legislators with a "package" in our request for state funds for child health, indicating all our needs, rather than with piecemeal requests for funds for one program or another, and leaving the priority decisions up to them.

In the area of private funding of programs, this will have to remain a piecemeal affair. However, it would be good to have programs well developed, on paper, for the benefit of those interested in investing private funds for child health. Good publicity helps to advertise the needs, and some of our effort should be directed along these lines.

C. Manpower

Throughout this report, we have tried to indicate the ways in which we may recruit more health workers to our state.

To meet our immediate needs salaries will have to be raised in all Divisions of Health and Social Services to compete with those offered in other states. Various incentives will have to be offered to physicians to enter private practice in the lower counties. One solution would be to offer a group practice set-up, similar to the Beebe Clinic, where a new physician would receive a guaranteed income, with the option of full partnership in the group within a period of time.

Long range plans for increasing manpower rest on the development of educational opportunities within the state, to include all members of the health team, from the physician, dentist, and nurse all the way down to aides, with sufficient opportunity to move up the ladder through further education and/or experience in the special health field one is engaged in. Appropriate work-study programs need to be developed to interest young people in entering health careers.

Part of the manpower should come from minority groups, and special scholarships should be made available to promising students from urban and rural areas, with the expectation they will return to their home areas to practice.

Further manpower should come from the use of indigenous members of any community, who, with appropriate training, can become useful members of the health team and at the same time increase their own self-image and status in the community.

Until we develop sufficient manpower to cope with the many medical problems facing our community, no amount of money will solve the problem of delivery of health care. We see the handwriting on the wall that compulsory health insurance for everyone is on the way, either on a private or a public basis, and we must be prepared to meet the demand for child care.

D. Legislation

The primary need for legislation is appropriation of funds for programs, salaries, scholarships, etc., heretofore mentioned.

Legislation is needed for legalizing the activities of physicians' assistants and pediatric nurse practitioners and nurse practitioners in allied fields, such as Obstetrics.

We propose legislation requiring that certain immunizations be made mandatory prior to entering school.

Legislation extending the law regarding mandatory reporting of abused children has been introduced, and we recommend that it be supported (H.S. 1 for H.B. 30).

We need legislation to lower the age at which a number of different kinds of handicapping conditions of children can be provided for in various state programs.

A bill allowing minors to receive medical care without parental consent if the physician feels it is in the best interest of the patient is being prepared, and we recommend that it be supported.

A more liberal abortion act needs strong support by the medical community.

These are laws presently under consideration by the 126th General Assembly. As the need arises, more bills will have to be introduced, and a legislative committee of the Council on Children and Youth should play a strong role in their development and support.

Conclusions

Delaware is a small state, and we should be able to mobilize our resources and do a good job of planning and restructuring the delivery of health care to children throughout our state. Let us organize now, plan now, and act now to preserve the quality of life and health that our children so richly deserve.

Marjorie J. McKusick, M.D.*

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*Dr. McKusick is currently chairman of the Delaware Chapter, American Academy of Pediatrics.

Valley Springhouse

—R. Douglas Sanders, M.D.

Physicians are invited to send the Journal photographs of their art work: brush, camera, pen, chisel.

Editorials

THE CRY OF THE SUPER-HUMAN

Downstate Delaware is growing at a steady rate of approximately two percent annually. When I arrived in the area, it seemed to me that this part of the country was underpopulated and in no need of another physician. How naive I was! This area (Sussex County) has approximately 80,000 inhabitants; and at the growth rate of two percent per year, it will need not only more physicians but also a revamping of the whole method of dispensing medical care.

In Seaford, for example, Nanticoke Memorial Hospital serves an area of approximately 35,000 people. In this same area there are only fourteen physicians actively engaged in private practice, some of whom are in the process of slowing down to seek retirement. The result is an average patient load of nearly 2,500 per physician. It is extremely difficult to render medical care to this many people.

It would be helpful if the emergency department of the hospital could be depended upon to handle the overflow from private practice. However, the hospital finds it nearly impossible to keep the emergency department staffed with resident physicians. Consequently, the private physician often finds himself not only unaided by the hospital but also faced with the added burden of covering the emergency department. He may have to leave an office full of patients, who are waiting for his services, in order to travel to the hospital and attend an emergency. Depending upon the nature of the emergency, it may be several hours before he can return to his office where he usually finds "standing room only" in his waiting room.

To compound his problems, the downstate physician is expected by his patients to be available twenty-four hours a day. He must hold evening hours to care for those who must work during the day and can only afford to be sick at night. He is prone to get the unexpected call at two o'clock in the morning from a patient who has just finished shift work and is suffering from a minor ailment. The physician is expected to be a super-human with no need for rest, sleep, or indulgence in the common human weaknesses. To summarize, the whole matter is expressed simply by the word, "HELP."

My office supposedly works by appointment. Many chronic cases are scheduled for weekly, monthly, or six weeks' follow-up but are rarely seen promptly as scheduled since there are usually many acute cases which must be seen as well. I try to see these unscheduled cases between appointments and the relentless march of the clock. Since my arrival in lower Delaware, I have tried many times to limit my practice to Cardiology, but all of my attempts have been unsuccessful. The need for physicians here is so great that it is really impossible to refuse a patient who is truly sick and in need of help simply because the nature of his illness does not fall within the confines of my specialty. This has brought my practice to the point of treating anything from a myocardial infarct to seborrheic dermatitis. In other words, my specialty is "Skin and Its Contents."

And how do we solve this problem without downgrading the quality of medical care? The only solution, as I see it, is to attract more physicians to the area and to begin a group medical practice. This can be done by building medical centers in the vicinity of the hospitals. Group type of private medical practice with multi-specialties and twenty-four hour emergency coverage will improve medical care. At the same time, it will diminish the work load of physicians, and provide quick referrals and treatment. It will also decrease the workload of the hospitals' emergency departments. This type of practice will give the physician more time to keep himself abreast of the multiple facets of his specialty. It will also provide much needed rest and improve the coronary blood flow of his myocardium.

I mentioned group private practice because it is important to keep our profession within the limits of free enterprise and not under official or governmental dictations. I have had experience with both and, believe me, there is no comparison with the free enterprise system. In this system the incentive to keep yourself abreast of the medical fields of your choosing belongs to you and your self *de*termination. In the other you are prone to reach the point of your self *ex*termination.

D.A.A.

* * *

A PHONE MESSAGE TO DOCTORS

The basic tools of medical practice, era 1970's, are readily admitted to include in addition to stethoscope, eyes, ears, and fingers, the telephone. Until recently, physicians throughout Delaware were forced to use commercial answering services, services with many other types of clients than physicians. In Wilmington, the largest number of physicians and other users of telephone answering were concentrated in one organization.

Recently a new telephone answering service, the Medical-Dental Bureau, opened its doors (earphones?) in Wilmington. Several years in gestation, the Medical-Dental Bureau was conceived by a group of New Castle County physicians and dentists who were not altogether satisfied with the commercial service available. They were hopeful that a nonprofit service owned by doctors and dentists and operated by them and exclusively for them would perform better than a commercial service which mingled calls for physicians with, eg, oil burner repair calls. This new service would also presumably be more cognizant of physicians' special requests and problems.

We'll admit the new telephone exchange's services weren't originally as polished as our former service, a service whose performance we personally feel perked up considerably as soon as there was talk of a competitive service. The major commercial service now has been abandoned, but not without warning, by some 150 of its former customers who have chosen to become clients of the new bureau. This older service is the local branch of a corporation of answering services. As such, it has the organizational capacity and financial backing to exert significant pressures and cajolements to try to induce physicians not to leave it for the Medical-Dential Bureau. The very fact, however, that these cajolements were proffered is evidence of the importance to all New Castle County physicians of there being more than one telephone answering service. Monopolies do not cajole their customers; competing services do.

For these reasons, therefore, we wish the new answering service well, and urge forbearance of its charter members who suffered its early inevitable inefficiencies. We hope that other non-subscribing physician members will give some thought to the importance of there being more than one viable answering service in the area, and to the at least practical superiority of having the service which answers their phones responsible to a board of physician directors rather than to an out-of-town corporation of non-physician businessmen.

B.Z.P.

* * *

WHERE THE DOCTORS ARE: DELAWARE

A recent study rates each state in the Union above or below its share of physicians as correlated with its share of the US population.[1]

Delaware lags behind in "primary physicians," being 15% deficient in general practitioners and 11% deficient in internists.

When it comes to specialists other than internists, we aren't quite so skimpy. We've within 5% of our expected share of general surgeons, and exceed our share of gynecologists by 12%. We've 19% more than our share of pediatricians, and 8% more than our share of psychiatrists.

B. Z. P.

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[1] Distribution of Physicians, Hospitals, and Hospital Beds in the US. 1967: An AMA Dept of Research Publication.

Letters to the Editor

To the Editor:

The problem of the Abused and Neglected Child has been brought to public attention in Delaware through a hard-working, fact-finding committee of the American Association of University Women. Their study, entitled "Where Do Children Go?", has received national recognition, through an article published in the AAUW *Journal*, March 1971.

A three-day seminar was held in April under the auspices of the AAUW, the University of Delaware, the Division of Social Services, and the Family Court of New Castle County at the Wilcastle Center.

I was disturbed to learn that only one practicing physician attended this meeting of over 200 people. The lack of interest and cooperation of the medical community in such a vital problem is distressing to those working on this problem and those concerned about the welfare of children in our State.

There are many possible explanations for the absence of medical representatives at this meeting. I think we are all concerned and interested, and I am writing this letter to enlist your support in a way that will show our interest. There is presently a bill in the State Legislature, H.S. 1 for H.B. 30, which is considered a model bill for reporting of cases of child abuse and neglect. I strongly urge that you write, phone, or wire your representative and support this bill. This legislation has been supported by the Public Laws Committee and the Board of Trustees of your State Medical Society. However, a personal vote carries more weight, and if you do this now, you can show your concern for the problem, and help these children in need.*

Those interested in more details can get a reprint of the article "Where Do Children Go?" through the AAUW office, 1304 Delaware Avenue, Wilmington, Delaware, 19806. I also recommend a book entitled *Violence Against Children*, written by David G. Gil, published 1970 by the Harvard University Press, which is an excellent analysis of the total problem in our country.

Marjorie J. McKusick, M.D.

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*EDITOR'S NOTE: H.S. 1 for H.B. 30 has now passed the Legislature.

To the Editor:

The medical assistant in the physician's office is a very important cog in medical practice, but not all physicians know about their organization.

Too few physicians realize that there are both a Kent County Chapter and a New Castle County Chapter of medical assistants organized in the State of Delaware. Does your "Girl Friday" belong to either? If not, you are missing an excellent opportunity to help her help you.

DAMA is an allied health group of ladies working with and for physicians. Their primary objective is self-improvement so that they can better serve the medical profession and the public. It inspires the members to give honest, loyal and efficient service, to improve their educational background, and to better serve their employers.

This organization is structured in the same manner as organized medicine, with county (or local), state, and national groups. Its by-laws state that it will never become a union or a collective bargaining agency.

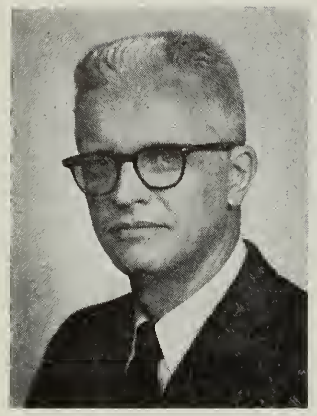
These young ladies answer the physician's telephone, greet the patients who enter his office, assist him in the care of patients, and placate the patient complaining about an appointment or a bill. They are the first and most important public relations agents in any practice. Help them to help you.

The Medical Society of Delaware and our county medical societies support DAMA and its county groups.

I urge each doctor to ask his secretary or nurse if she is a member of AAMA; if not, see that she joins. Her dues can be paid out of office expense. It is a good investment. Only through physician encouragement will DAMA become the important asset to medicine that it can be.

Daniel J. Preston, M.D.

Advisor, Delaware Association of Medical Assistants



President's Page

THE COMMUNITY PHYSICIAN

Mrs. Smith shopping in her community market meets her internist and asks, "What can I do for Johnnie's bed-wetting problem?" Her internist asks who is Johnnie's pediatrician and gently refers Mrs. Smith's question to a pediatrician. All of this causes Mrs. Smith to reflect and all of us to pause and wonder who is their community physician.

Communities across the country expect some variations in their community doctor. Some communities expect him only to see their medical problems, others expect him to be medical and obstetrical in his efforts, and still others look to him to be their surgeon, obstetrician, pediatrician and internist rolled into one man.

With great consistency all communities hold that the well-rounded community physician should maintain an office in the community, treat all members of the family (and anyone who may visit) in his office, their home, or their hospital emergency room while being available or having a substitute available twenty-four hours a day, three hundred sixty-five days a year, with a day added every four years. If a physician doesn't help with the families' social problems, doesn't enter into the affairs of his town and county, doesn't present himself as a man of science continuing his education, and doesn't lead in church affairs and as a contributor to civic needs, he is not regarded as the complete community physician.

In this modern, fast-paced year of 1971 can each community boast of even one such community physician? There is only one answer as long as the manpower shortage continues among physicians. The shortage is certainly in the total number of physicians, but the shortage in community physicians is more directly a result of the lip service given by the specialist when he states, "A general practitioner! You are the prince among us, we need you!" and a result of the mockery that medical schools make when they lionize the general practitioners and never attempt to train a single generalist. Maybe we should quit the deception of ourselves and the public — the community physician no longer exists.

Rhodyn J Bishoff

Delaware Academy of General Practice

FLORIDA SITE FOR ASSEMBLY THIS YEAR

The Academy's top postgraduate event of the year — the Annual Scientific Assembly — wil be held this year at the Convention Hall in Miami Beach, Fla. The dates are October 4 through 7.

An outstanding "bill of fare," long a characteristic of this multi-offering educational experience, will be led off by Robert Young, television's "Marcus Welby, M.D.," who will keynote the meeting by relating his experiences in learning about the importance of family medicine through his participation in the television role. The award-winning television series is endorsed by the Academy.

Following Mr. Young will be a multimedia mixture of vital medical subjects from top professionals in all areas of medicine. Included, and choice, wil be:

- *Mental Health and the Physician*, by Dr. Roy W. Menninger of the Menninger Foundation, Topeka, Kas.
- *The Psychology of Dying*, by Dr. Elizabeth K. Ross, Flossmoor, Ill.
- *Current Treatment of Infertility*, by Dr. Robert B. Greenblatt, Medical College of Georgia
- *Surgical Treatment of Advanced Heart Disease: Repair and Replacement*, by Dr. Denton A. Cooley, Texas Heart Institute, Houston.

A glittering string of opulent ocean-front hotels will host Academy members and their families who take this opportunity to combine a sun-and-sand vacation with some solid postgraduate professional learning. These hotels provide a full-range of vacation diversions.

With certification, peer review and other new regulatory factors possibly in the wind now for American doctors, the Academy's long insistence on quality postgraduate education for its members is being vindicated in all US medical circles. The Assembly is one of the best and most pleasant ways to take part in this vital program.

The Congress of Delegates will meet Saturday, October 2, through the morning of Monday, October 4, at the Fontainebleau. The Delegates' Dinner will be held Monday night, October 4, and the President's reception and dance will be Wednesday night, October 6. Inauguration of new officers and directors will immediately precede the President's reception. All social events will be held in the Fontainebleau. A ladies' program, featuring a panel discussion of a current topic by leading female personalities, is being planned.

A post-Assembly tour aboard a cruise ship in the Caribbean will follow the close of the Assembly. One port of call will be St. Thomas, Virgin Islands, where the post-Assembly group will meet with members of the new Virgin Islands chapter. The ship is scheduled to sail Saturday, October 9. For information contact Group Travel Services, Inc., 3547 Broadway, Kansas City, Mo. 64111.*

*Released by the American Academy of General Practice.

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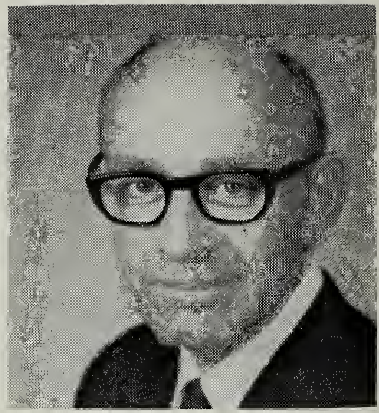
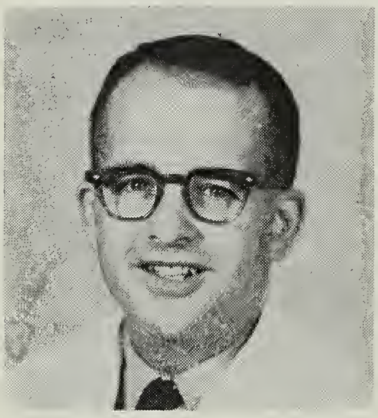
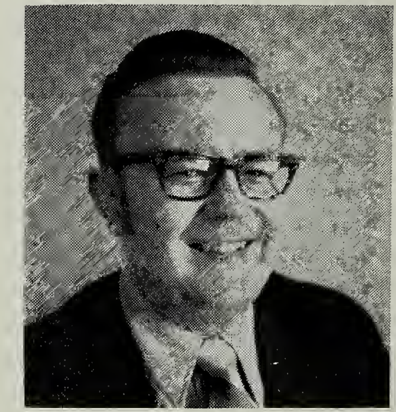


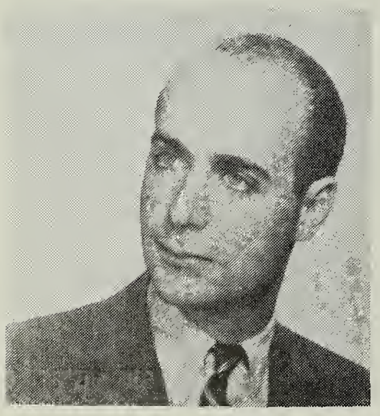
William V. Whitehorn, M.D., University of Michigan Medical School, '39, is a native of Detroit, Michigan. Dr. Whitehorn's specialty is academic medicine. He has a special interest in cardiovascular research. He is currently Special Assistant for Medical Affairs to the President of the University of Delaware and Head, Health Sciences. Dr. and Mrs. Whitehorn are the parents of three sons. He enjoys fishing, camping, golf, tennis, and chess during his leisure time.



Vincent DelDuca, Jr., M.D., University of Pennsylvania School of Medicine, '59, was born in Moorestown, New Jersey. After an internship at the Hospital of the University of Pennsylvania, he served a residency and a fellowship in hematology at the University Hospitals of Cleveland. Doctor DelDuca was previously Chief of Hematology at the Veterans Administration Hospital in Cleveland and Chief, Nuclear Medicine Section, Valley Forge General Hospital. He is a board-certified internist, specializing in clinical hematology. Office: Professional Building, Wilmington. He and his wife have a son and two daughters.



Leo B. Hogan, Jr., M.D., an Idahoan by birth, graduated from the University of Utah College of Medicine in 1964. His internship was spent at the Delaware Hospital, followed by a residency at the Wilmington Medical Center. Dr. Hogan's specialty is internal medicine with a special interest in infectious diseases. His office is located at 1711 Woodlawn Avenue, Wilmington. His residence in Briarwood is shared by his wife and young daughter. Dr. Hogan enjoys camping (travel trailer type) and photography. His ham radio call letters are K3SJR.



Anthony L. Cucuzzella, M.D. is that rare breed, a native Wilmingtonian. He graduated from the New Jersey College of Medicine, '62, interned at Hahnemann Medical College Hospital, and served a residency at the Hospital of the University of Pennsylvania. Dr. Cucuzzella's specialty is physical medicine and rehabilitation. His office is at 3506 Kennett Pike, Wilmington. Dr. and Mrs. Cucuzzella reside in Sharpley with their three children. Classical music and the theater occupy Dr. Cucuzzella's spare time.

In Brief

In the News

Alfred R. Shands, M.D., medical director emeritus of the Alfred I. duPont Institute, received the first Governor's Silver Award for Outstanding Service to the State of Delaware. Governor Russell W. Peterson made the presentation at the opening session of the statewide White House Conference on Aging in May at the University of Delaware Student Center.

Davis G. Durham, M.D. has become the first Delawarean to be elected a member of the American Ophthalmological Society. Dr. Durham was accepted into membership at the 107th annual meeting in Hot Springs, Va., and joins 225 other eye specialists in the membership out of 10,000 ophthalmologists in the United States. This society, founded in 1864, is the oldest medical organization in America devoted to a specialty.

Reducing After Forty by Girard S. Serino, M.D. was released in April 1971. Doctor Serino has written a previous book, *Your Ulcer*, and is planning a book on venereal disease.

Speakers on "Ask the Doctor"

Speakers for July 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: July 6, I. Favel Chavin, M.D., *Reconstructive Surgery for Arthritis;* July 13, Daniel J. Preston, M.D., *Hernias in Children;* July 20, Gershon A. Klein, M.D., *Genetic Counseling;* July 27, Vincent DelDuca, Jr., M.D., *Anemia.*

Loan Plan for Medical Students

An interest-free loan plan for medical students has been announced by the American Medical Association Education and Research Foundation. The Foundation's Student Loan Guarantee Fund will be expanded to provide interest subsidies to deserving needy students. The amount of loans and number of students subsidized will depend on the success of an expanded fund raising effort being launched by AMA-ERF to finance the program. The program will be conducted in cooperation with US medical schools, which will be asked to provide grants and scholarships for the first two years of medical school, with AMA-ERF guaranteeing loans on an interest-free basis all four years. The borrower would assume interest payments during his internship and residency and be responsible for both interest and principal payments when he enters practice. He has 10 years following completion of training to repay the loan. Information and application forms for student loans are available from the American Medical Association Education and Research Foundation Student Loan Guarantee Fund, 535 North Dearborn, Chicago, 60610.

Drug Efficacy Booklet Available

The FDA has recently begun to review the efficacy of more than 3,000 pharmaceuticals presently on the market and to order discontinuation of the sale of those for which "scientific" proof of efficacy is lacking. A lucid booklet outlining the genesis of these developments is available from Smith Kline and French Laboratories, 1500 Spring Garden Street, Philadelphia, 19101. Ask for: *A Chronology and Review of the National Academy of Sciences/National Research Council Drug Efficacy Study.*

ARC Pamphlet

First aid procedures for the care of persons who may be suffering from drug abuse or overdose are now available in a new pamphlet being distributed by the American National Red Cross. Entitled *Drugs and Their Abuse,* the publication is based on material developed for the American Red Cross by the National Academy of Sciences — National Research Council. The pamphlets are now being shipped to Red Cross chapters throughout the country and will be made available to schools, organizations, industrial groups, and interested individuals for the price of five cents a copy.

Women's Lib?

The Association for Voluntary Sterilization estimates that about 75% of all voluntary sterilizations done in the country are male operations, a switch from 10 years ago when about 60% of operations done were for women. "Probably three million living Americans of childbearing age, both men and women, have now obtained sterilization," says John R. Rague, Executive Director of the Association for Voluntary Sterilization, Inc.

Red Blood Cell Producing Hormone Isolated

Erythropoietin, a hormone which stimulates red blood cell formation, has been isolated from anemic sheep by Dr. Eugene Goldwasser, a Professor of Biochemistry at the Pritzker School of Medicine, Chicago. "The existence of erythropoietin has been known for at least 50 years," Dr. Goldwasser said, "but it is present in such minute traces that, until now, we haven't been able to isloate it."

The difficulty of the undertaking is clear when one considers that obtaining about 0.000002 gm of the hormone required blood from 150 anemic sheep. To produce enough of the pure material to treat five patients with anemia would cost around $75,000, Dr. Goldwasser estimated. Thus, even if erythropoietin should prove an effective treatment, it will be a long time before it is available for clinical use.

P. Carnot of France first suggested the existence of erythropoietin in 1906. Between then and 1955, other scientists demonstrated that the hormone was there and that it acted specifically to produce red blood cells, although they were unable to isolate it.

It has been known for some time that some patients who suffer from anemia produce large amounts of erythropoietin, but it is excreted in their urine. Not everyone with severe anemia, however, produces the hormone. Patients with kidney disease are a good example of the second category, and it is likely that these are the people who will receive the first clinical doses of erythropoietin.

Delayed CHAMPUS Payments

for care received under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) is being delayed because sponsors and beneficiaries are not completing their portion of the claim form properly. Item 5, Identification Card Data, causes particular difficulty. Sponsors and beneficiaries have been reminded to include the card number and both the effective and expiration dates. They must also be careful, CHAMPUS offiicials point out, not to confuse the issue date with the effective date. The effective date of a dependent's card is on the reverse side of the card. In the case of retirees the effective date is the date of retirement.

NIH Clinical Studies

The cooperation of physicians is requested in the referral of patients with acute myelocytic leukemia for clinical studies being conducted by the National Cancer Institute's Baltimore Cancer Research Center at the USPHS Hospital, Baltimore. These studies are aimed at reducing the incidence of serious infections during remission induction with intensive cancer chemotherapy. A controlled trial is in progress to determine whether a sterile environment provided by a laminar air flow room plus suppression of endogenous flora is superior to routine care with or without fecal flora suppression. Hospitalization, outpatient visits, medical services, and drugs are provided without charge. Upon completion of their studies, patients will be returned to the care of the referring physician or followed cooperatively with the Center's physicians. Interested physicians may write or telephone: Howard M. Shapiro, M.D. or Stephen C. Schimpff, M.D., Baltimore Cancer Research Center, 3100 Wyman Park Drive, Baltimore, Md., 21211. Telephone: 301-338-1100, ext. 247.

CLINICAL NOTICES AND MEETINGS

Surgery Seminar

The second annual seminar in General Surgery will be held at Colby College, Waterville, Maine, July 22 and 23, 1971. The seminar will concern itself with management of trauma, vascular disease, breast disease and problems of the biliary tract. For information write: Paul D. Walker, Jr., Director of Special Programs, Colby College, Waterville, Maine, 04901.

ACP Course

The American College of Physicians presents *Recent Advances in Rheumatic Diseases,* July 26-29, 1971, The Stanley Hotel, Estes Park, Colorado. For information write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Phila., 19104.

Occupational Health Congress

The 31st Annual AMA Congress on Occupational Health will be held at Jackson Lake Lodge in Grand Teton National Park, Wyoming, August 29-30, 1971.

AAMC Annual Meeting

Prepaid medical care, health maintenance organizations, financing of health services, and training and use of allied health personnel will be the featured topics at the 22nd Annual Meeting of th American Association of Medical Clinics, to be held September 14-18, 1971 at the Sheraton-Cleveland Hotel, Cleveland, Ohio. Prospective non-member attendants may secure further information by contacting AAMC, 719 Prince St., Alexandria, Va., 22313.

GP Continuing Education Course

The Arizona Academy of General Practice will offer a three-day Continuing Education Course at the Bahia Hotel, San Diego, California on October 20-23, 1971. With the receipt of a $50.00 check to cover tuition fee a member will be allotted a slot in one of the eight courses; mail to Arizona Academy of General Practice, 3627 N. 60th Street, Scottsdale, 85251.

Chest Physicians Session

The American College of Chest Physicians (ACCP) will hold its Third Annual Fall Scientific Assembly (37th Annual Meeting) in Philadelphia, October 24-28, 1971. All sessions will take place at the Sheraton Hotel. The 1971 meeting will have as its theme *Respiratory and Cardiovascular Care, The Clinician's Challenge.* For further information write: Alfred Soffer, M.D., Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago, 60611.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

UROLOGIST: Board certified. Experience in Hemodialysis and Renal Transplantation. Available in July after fulfilling military obligation.

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THE FORUM

Environment And Health

WOMEN AND CIGARETTE SMOKING

Dolores V. Antoine

For several years after the Surgeon General's 1964 report on *Smoking and Health* there was evidence that cigarette smoking in America had declined. More recent surveys indicate, however, that smoking is again on the rise in the United States and that the upturn is accounted for largely by an increase in smoking among women.

That's the report by Dr. Jesse L. Steinfeld, the current Surgeon General, in the May *Bulletin* of the National Tuberculosis and Respiratory Disease Association. Dr. Steinfeld says one-third of all women of child-bearing age are smokers, and the number is increasing as more and more teen-age girls turn to smoking. Furthermore, he says that women who start smoking generally find it harder to quit than men.

There is now some evidence indicating that smoking during pregnancy harms the unborn child by retarding fetal growth. There is also evidence that mothers who smoke suffer a significantly greater number of spontaneous abortions, stillbirths and infant deaths. Indeed, one study showed that women who smoke have 20% more unsuccessful pregnancies than women who do not.

And, although Dr. Steinfeld's article does not mention it, it seems reasonable to conclude that smoking mothers may threaten the health of older children, especially their daughters, by providing an example of smoking their children may imitate. Recent studies show that the number of girls between 12 and 18 who smoke has jumped 3½ percent in just two years, and the greatest increases have been at ages 13, 14 and 15.

The Surgeon General suggests that one reason fewer women than men have quit smoking is that, so far, women have not suffered as much from smoking-related death and disease as men have. Women, he says, smoke differently; they smoke less, inhale less often and less deeply, and use milder cigarettes. But women are beginning to smoke more like men, and the tobacco companies are flooding the women's magazines with ads to encourage more smoking so the pattern may change.

Few women now in their 70's and 80's are or have been smokers because smoking among women was not really fashionable until after World War II. Since then, more and more women have smoked, and they have started at increasingly earlier ages. If the trend continues, the statistics for heart disease, lung cancer, emphysema and other smoking-related diseases among women may rise toward the already disastrous levels found among male smokers.

The increase among women smokers, Dr. Steinfeld concludes, creates both private and public health concerns that must be addressed by the health professions. Obstetricians and gynecologists should tell their patients how smoking can affect their own health as well as the health of their unborn children, while adult practitioners and pediatricians should educate both women and their young daughters.

Smoking is always a threat to health, but smoking among women is especially serious because of the influence of mothers upon their children, both before and after birth.

Miss Antoine is Director of Education, Delaware Tuberculosis and Health Society.

This page is sponsored by the Delaware Tuberculosis and Health Society.

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THE MUSHROOM TOXINS

• Toxic mushrooms, their toxins, and present concepts of treatment are reviewed. Silver spoons are no good.

Donald M. Simons, Ph.D.

Excepting inscriptions on tombstones,[1] the first recorded case of mushroom poisoning in the United States was reported in 1871.[2,3] Subsequent records are rather rare, and Buck[4] found only 35 fatalities described in the American literature from 1924 to 1961. The actual number is, of course, greater, but the estimate of 50 fatalities per year in the US given by Block et al,[5] and subsequently quoted by others, is much too high, at least for recent times.

A considerable number of people enjoy eating wild mushrooms (mycophagy), and there is no sign this activity in on the wane. Some of the wild species are truly delicious, reducing the commercial mushroom to the rank of a pale pretender in comparison. Perhaps the spirit of the true mycophagist is best indicated by the first two sentences from the forward of a magnificent cookbook published by the Puget Sound Mycological Society:[6] "This book is for the hunter of wild mushrooms. Those who trust only in the mushrooms that come in little boxes from the supermarket will get along adequately with their Betty Crocker."

Mushroom Allergy

Fungi must be placed close to the top of any list of allergenic foods. Many people cannot eat the commercial mushroom, and the different symptoms manifested from one individual to another reflect how wide the variations in personal biochemistry can be. Malaise, mild or severe gastrointestinal upset, headache, sniffles and other cold-like symptoms are common. A Delaware acquaintance of mine must take extraordinary precautions when eating in restaurants as consumption of a very small quantity of mushrooms hidden in sauces or dressings is followed in about four hours by vomiting, diarrhea and loss of consciousness.

Obviously, eating wild mushrooms expands the risk of incurring an allergic reaction, and some disagreements concerning the edibility of certain species undoubtedly involve nothing more than individual sensitivity.[7] My personal poison is the otherwise excellent mushroom *Ptychoverpa bohemica;* some four hours after eating it, I become so remarkably uncoordinated that even such a simple task as writing is difficult. Others also experience this effect, but most people eat it without consequence.

The author is a research chemist with the duPont Company, an amateur mycologist and a sometime mycophagist. It is primarily the last activity that prompts his interest in the mushroom toxins.

TABLE I. TOXIC MUSHROOMS.

Group	Mushrooms	Toxins	Organs attacked (mechanism)	Antidote
1a	Amanita phalloides group	Cyclic octapeptides (amanitins)	Liver and kidneys (inhibition of RNA transcription)	Thioctic acid
1b	Galerina marginata group	"	"	"
2	Gyromitra esculenta	Monomethylhydrazine and its derivatives	Central nervous system (depletion of B_6 vitamers)	Pyridoxine hydrochloride
3	Inocybe and Clitocybe species	Muscarine	Autonomic nervous system (cholinergic stimulation of parasympathetic system)	Atropine
4	Amanita muscaria, A. pantherina	Muscimol, ibotenic acid	Central nervous system (hallucinogenic)	Treatment symptomatic
5	Psilocybe, Conocybe, Stropharia and Panaeolus species	Psilocybin, psilocin	Central nervous system (hallucinogenic)	Chlorpromazine to terminate hallucinations
6	Coprinus atramentarius	Unknown, but disulfiram-like	Vascular system (strong dilation)	Reassurance

Buck[8] has suggested that the deaths of six young children (unrelated cases) in which prior consumption of wild mushrooms might have been a factor may belong in the category of childhood toxic encephalopathies. Some of the mushrooms mentioned can hardly be considered poisonous in the usual sense. This type of encephalopathy may result from an innate metabolic defect or from a delay in the development of the full detoxifying capability of the liver. In general it may be unwise for very young children or organically ill persons to eat wild mushrooms.

Bergoz and Righetti[9] have attributed one case of mushroom allergy to an inability to absorb trehalose.

Scope and Format

Only those poisonous mushrooms for which the toxins are either known or are pharmacologically analogous to known compounds are considered in this review. These are listed in Table I in the order of discussion. Most cases of serious mushroom poisoning in the US will likely involve the first three groups in this table. The active principles in groups three, five, and six (muscarine, psilocybin and a disulfiram-like substance, respectively) have been known for a long time and the discussion of these groups is therefore brief.

Toxic Mushrooms and Mushroom Toxins

1a. The Amanita Phalloides Group. History, Mycology, and Chemistry

The *Amanita phalloides* group is estimated to be responsible for 95% of the fatal cases of mushroom poisoning throughout the world. Mute testimony to the terrible suffering of *A. phalloides* victims is provided by seven mummies, a single family, now in the crypt of the Tour St. Michel, Bordeaux, France. Workmen moving these mummies, along with 63 others, from a fifteenth century cemetery to the crypt in the year 1810 were so disturbed by the expression of pain, still clearly evident on the faces, that special efforts were required by the priests and civil authorities to keep the work in progress. The most tragic single incident involving *A. phalloides* occurred in 1918 near Poznan, Poland: thirty-one school children died from eating a mushroom dish served at the school.

A. phalloides is predominantly a European species, although it has been collected in Pennsylvania and along the west coast of the US. The related and more common American species are *A. verna* (Figure 1), *A. virosa*, *A. bisporigera* and *A. tenuifolia.* The stipe (stem) and gills of *A. phalloides* are white, but the pileus (cap) is normally greenish with dark, radiating streaks. The other species are usually entirely white, although occasionally the pileus may have a faint creamy tinge. All amanitas of this group grow out of a conspicuous volva or cup (the remnants of the rather tough membrane which enveloped the "button" stage of the young mushroom) and are further characterized in mature specimens by an annulus, the ring or skirt of tissue hanging around the stipe below the pileus. (In young specimens the tissue which gives rise to the annulus extends from the stipe to the margin of the pileus, thus covering and protecting the young gills.) *A. verna* and *A. bisporigera* are common in Delaware during August and September when weather conditions are appropriate. The earliest record I have for their appearance is July 11th; in 1970 *A. verna* appeared in mid-November, which was unusually mild and wet.

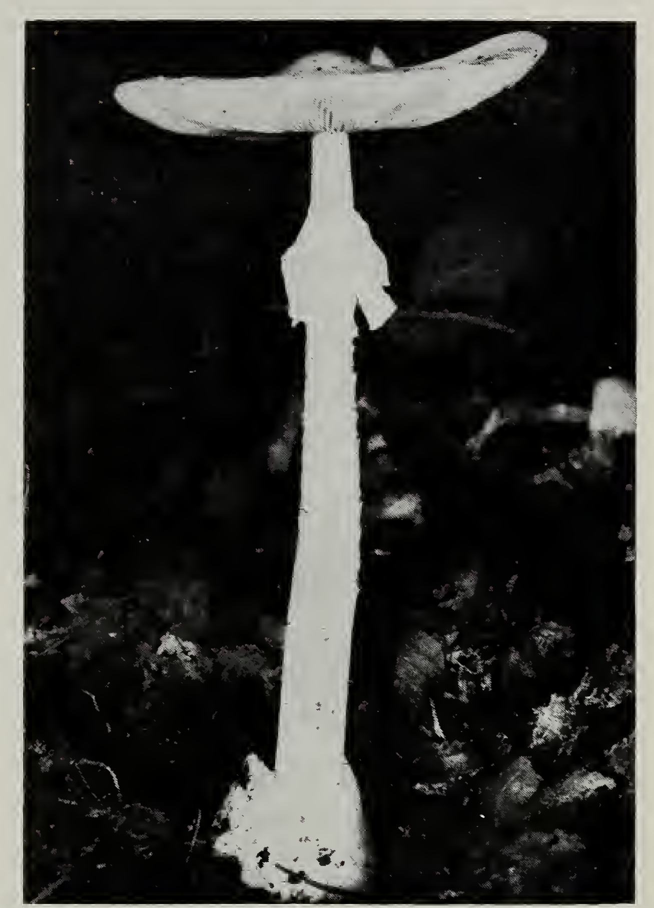


Figure 1. Amanita verna

The chemical structures of the poisonous principles in the *A. phalloides* group have been determined by Wieland.[10] The toxins fall into two series: the phallotoxins, consist-

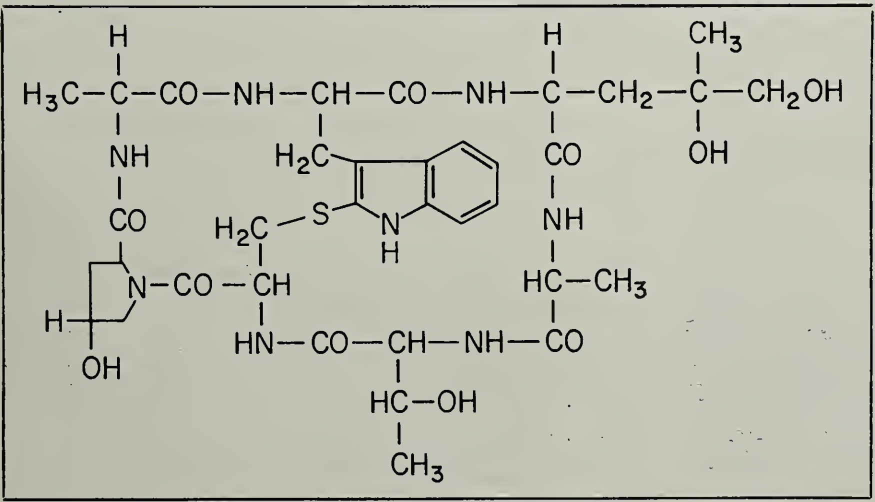


Figure 2
Phalloidin

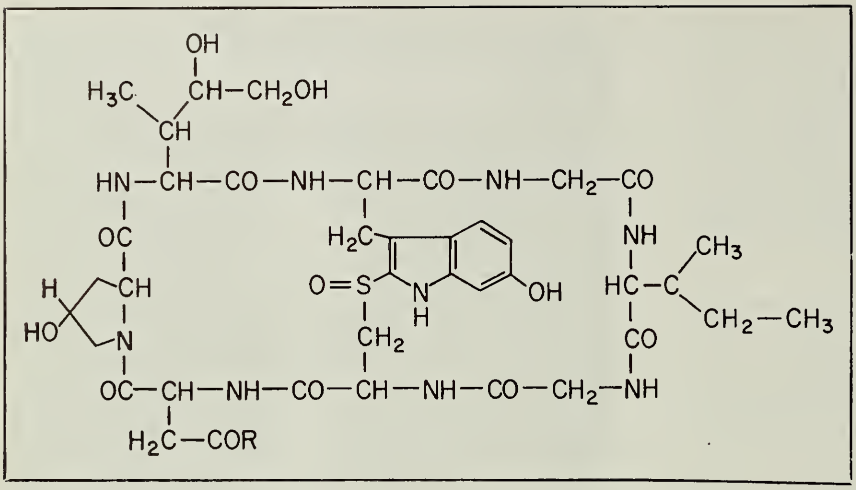


Figure 3
The Amatoxins
α - Amanitin (R = $-NH_2$)
β - Amanitin (R = $-OH$)

ing of cyclic heptapeptides, and the amatoxins, consisting of cyclic octapeptides. The mechanisms of toxic action are completely different for the two series. Phalloidin (Figure 2) is the most abundant of the phallotoxins, and α- and β-amanitin (Figure 3) are the most important amatoxins. European *A. phalloides* contains on the average about 10 mg of phalloidin, 8 mg of α-amanitin and 5 mg of β-amanitin per 100 grams of fresh fungus tissue. As the lethal dose of the amanitins is estimated to be about 0.1 mg/kg of body weight for man, these data confirm medical experience that one mushroom cap or less can be fatal to an adult. Phalloidin has a much lower toxicity (LD_{50} = 2.0 mg/kg for white mice) and must therefore contribute relatively little to the human poisoning syndrome, unless unknown synergistic effects exist.

Determination of the amanitin content of the other species has been carried out by a number of workers,[11-14] and some representative analyses are shown in Table II. The high level of toxin in *A. bisporigera* is noteworthy as is the fact that some specimens of *A. verna* and *A. virosa* contained no toxin at all.

Toxicology

The amanitins appear capable of attacking many organs, but medically the kidneys and liver are usually the most seriously involved. A minimum lethal dose (MLD) of α-amanitin injected into a mouse damages the cells of the proximal convoluted tubules in the kidneys, but the liver is not affected; only when the MLD is exceeded does attack on the liver occur.[16 and references therein] Regardless of the dose level, conspicuous kidney dysfunction does not appear until about three days after administration of the toxin; liver damage, however, may be apparent in two days. Thus, at high levels of toxin, mice may die of hepatic necrosis before renal lesions show up at all.

The damage to the proximal convoluted tubules is postulated to occur as a result of reabsorption of α-amanitin from the glomerular filtrate. Similar damage in a case of human poisoning has been demonstrated by Myler et al.[17] It is an interesting fact that while α-amanitin produces liver necrosis in rats as in other animals, it has no effect on the kidneys. Consequently α-amanitin is excreted rapidly, and rats are much more resistant to poisoning than are other laboratory animals.

TABLE II. AMANITIN CONTENT OF VARIOUS AMANITA SPECIES. DATA FROM [13].

	No. of specimens analyzed	Total amatoxin content*
A. phalloides (*European*)	1	2.0
A. phalloides (*American*)	2	1.9-2.43
A. bisporigera	3	2.25-5.0
A. verna	10	0-1.7
A. virosa	3	0-<0.1

*mg per gram of dried tisue

The electron microscope reveals microlesions in the nucleus, and particularly in the nucleolus, of liver cells within minutes after injection of α-amanitin, even though, as mentioned above, conspicuous damage and dysfunction do not appear for some time. The biochemical phenomena underlying the morphological changes involve inhibition of RNA transcription from the nuclear DNA; the production of both ribosomal RNA, synthesized in the nucleolus, and nuclear (DNA-like) RNA, synthesized in the nucleoplasm, is severely inhibited, but transcription of transfer RNA is less affected.[18-19] Thus the deadly action of the amatoxins stems from interference with the fundamental process of life itself.

Treatment

The first signs of poisoning by the *A. phalloides* group, resulting from direct irritation of the gastrointestinal mucous membrane by the amanitins, are violent abdominal pain, persistent vomiting, and cholera-like diarrhea (often containing blood and mucus). The victim feels perfectly well until onset of these symptoms, which begin 6-24 (commonly 10-14) hours after ingestion of the mushrooms. With administration of saline and other appropriate therapy, these symptoms normally abate and the victim feels much improved for a time, but eventually indications of serious hepatorenal involvement become apparent.

Physicians confronted with suspected case of *A. phalloides* poisoning should immediately begin monitoring the serum glutamic-oxaloacetic (SGOT) and glutamic-pyruvic (SGPT) transaminase levels, as these have proved to be the earliest and most reliable signs of liver damage.[20] Immediate efforts to insure removal of any undigested fungus from the gastrointestinal tract are probably worthwhile, just in case emesis and diarrhea have not already accomplished this. Eventual oliguria or anuria should be anticipated.

The only drug supported by some evidence of effectiveness in *A. phalloides* poisoning is thioctic acid (α-lipoic acid). In 1964 Kubicka[21] reported that 39 out of 40 victims were saved by administering an infusion of thioctic acid (300 mg/day), salts and dextrose until the SGOT and SGPT levels decreased. Additional elaboration by Kubicka in 1968[20] mentions the case of a 19-year-old boy who had eaten ten specimens of *A. phalloides* and was saved. The best paper to date from a physician's point of view is that of Zaffiri et al,[22] who present tabulated data for seven patients, all of whom were saved. Some of the patients were given thioctic acid at peak rates of 700 mg/day. The thioctic acid treatment prevented an increase in SGOT and SGPT levels, and, most remarkably, alleviated the oliguria which is so characteristic of this type of poisoning.

A. J. Finestone et al obtained favorable results with thioctic acid in a case of mushroom poisoning at Temple University Hospital in November, 1970 (forthcoming publication).

Dabski et al[23] reported that thioctic acid was ineffective in treatment of two cases (father and daughter) in Poland, but this conclusion would appear invalid for the following reasons: (a) treatment was started late, (b) the dose was conservative (200 mg/day), and (c) the victims were very seriously poisoned. The father, found unconscious in the fields, died four days after admission, and autopsy revealed lesions in the kidneys, liver, brain, pancreas, lungs, and cardiac muscle (hemorrhage). The daughter died in five days of uncontrollable hemorrhaging from the gastrointestinal tract. For every toxic substance there is a dose level above which and a time interval beyond which no antidote can be effective.

Kubicka[24] tabulated data from hospital records of 20 cases of fatal poisoning by *A. phalloides* and *A. verna* in which thioctic acid therapy had been used. In all cases the treatment was too conservative, and in most cases it was started late.

Thioctic acid is present in food, manufactured by intestinal microorganisms and synthesized by the normal liver. It is an essential cofactor in several enzymatic processes.[25] Zaffiri et al[22] reported no adverse effects attributable to the high doses used by them. The LD_{50} for mice is 160-275 mg/kg intraperitoneally.[25] Thioctic acid does not have FDA approval for treatment of any disease (no applications have ever been made).

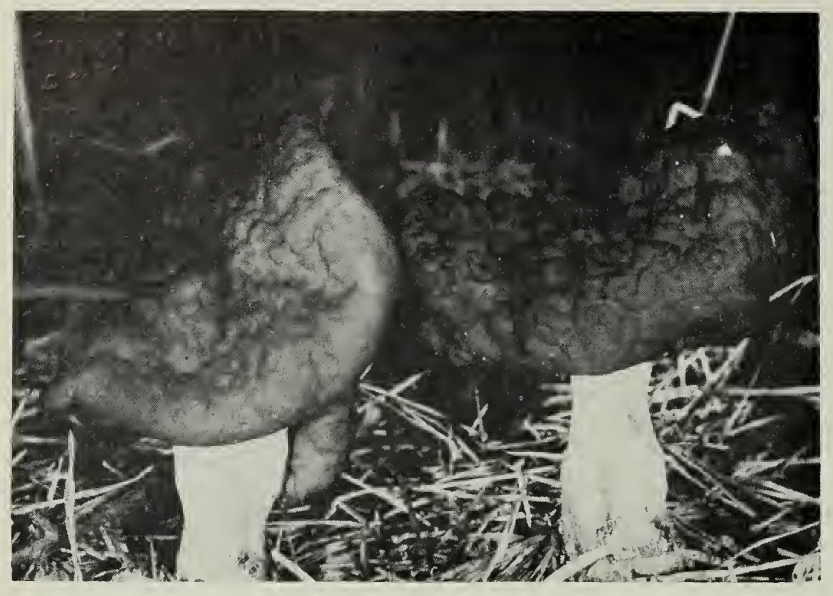


Figure 4
Gyromitra esculenta

Hemodialysis and peritoneal dialysis have been recommended in treatment of amanita poisoning.[17, 26-28] Out of a total of eight patients described in these references, six were saved. In view of the control of oliguria obtained with thioctic acid therapy, however, dialysis would now appear unnecessary.

1b. Galerina Spp.

Poisoning by *Galerina autumnalis*, *G. venenata* and *G. marginata* has been reported, and the similarity to *A. phalloides* poisoning was noted.[29] Analysis has revealed the presence of the amatoxins,[30] and mycelium of these species grown on synthetic medium may provide a source of experimental quantities of α- and γ-amanitin.[31]

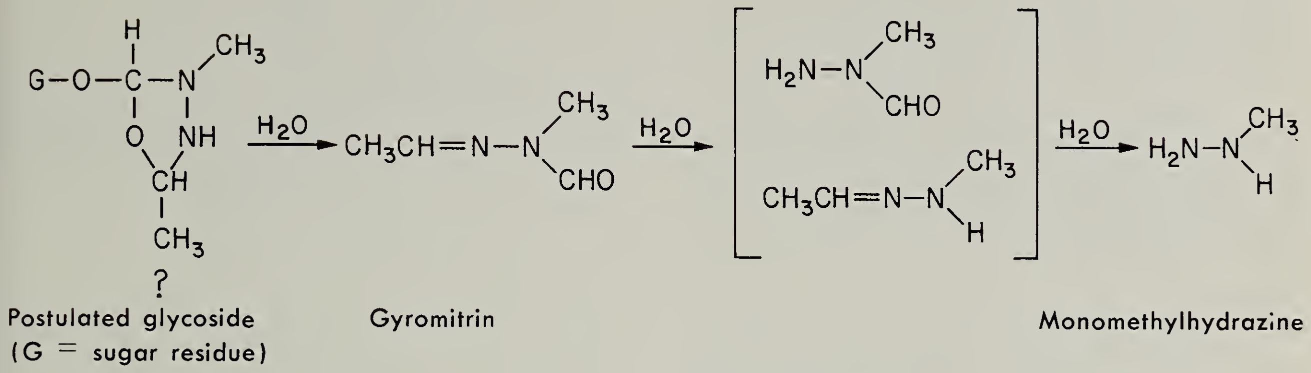
The galerinas are not closely related to the amanitas, and the occurrence of the same toxin in both genera gives one the uneasy feeling that chemical taxonomy has not come of age. *G. autamnalis* (at least) is found in Delaware. It grows on and around decaying logs and stumps.

2. *Gyromitra Esculenta.*
History, Mycology and Chemistry

Gyromitra esculenta (Helvella esculenta) represents a situation completely different from the toxic amanitas. The latter are always eaten by acident or in ignorance; *G. esculenta* is seldom mistaken for anything else — it is deliberately sought. Probably a million people throughout the world eat it every year. It is collected and eaten on a considerable scale in Michigan and Idaho, and gourmet shops in the US occasionally stock it canned, imported from France. Fatal poisoning is obviously infrequent on a percentage basis, but the scale of consumption insures that a number of cases turn up each year. The low poisoning frequency is undoubtedly a result of the almost universal practice of boiling the mushroom a long time in a large quantity of water and then discarding the cooking liquid. Many people are very allergic to *G. esculenta* regardless of the method of preparation.

Most persons seeing a specimen of *G. esculenta* the first time would probably not consider it a mushroom at all. The pileus is thin, wrinkled, folded, convoluted and usually somewhat saddle-shaped. (Figure 4) The color is normally dark reddish-brown, and no gills are present on the underside. Its love for sandy soil and conifer trees makes *G. esculenta* rare in northern Delaware, but it should occur more abundantly in the southern part of the State. It is an early mushroom, appearing from about mid-April to mid-May. *G. infula* and *G. underwoodii* have also been found in this area, but they are more consistently poisonous and are seldom used as food. These species fruit later in the season

Figure 5. Toxins in Gyromitra esculenta



and are unlikely to be mistaken for *G. esculenta.*

Helvellic acid, isolated in 1885 and originally claimed to be the toxin, is a harmless mixture of fatty acids. Only recently have the toxic compounds been identified as monomethylhydrazine (MMH) and its derivatives by List and Luft.[32, 33] The toxins do not exist in the free state in fresh tissue but are bound to an insoluble matrix, probably as the aglycone portion of a glycoside, and are released by hydrolysis. List and Luft have named the first hydrolysis product "gyromitrin" (Figure 5; the postulated glycosidic structure is mine).

Toxicology

MMH is used as a rocket fuel, and extensive studies on its toxicity have been carried out by the US Air Force.[34] It is a very toxic compound, affecting primarily the central nervous system, but with some action on other organs. There are some species specific effects: only dogs and man suffer blood damage, for example. (Hemolytic jaundice is a symptom of *G. esculenta* poisoning in man, and Böhm and Külz observed in 1885 that extracts of the fungus caused hemolysis and consequent kidney damage in dogs but not in other laboratory animals.) The exact mechanism of MMH toxicity is still not understood, although inactivation of the B_6 vitamers plays an important role.

In the past a great deal of mystery has surrounded some aspects of gyromitra poisoning. Sometimes only one of several persons eating from the same dish would be taken ill;[35] other times the first meal would cause no ill effects but the second one would result in serious or fatal poisoning.[36, 37] Such experiences can now be explained by results obtained by Back and Pinkerton,[38] who found that with Macaque monkeys there is an extremely narrow limit between a no-effect and a lethal dose of MMH. Administration of MMH to eight test animals at a dose of 5 mg/kg per day for three days resulted in no symptoms on day 1, vomiting (all eight) on day 2, and vomiting (four of eight) and convulsions (two of eight) on day 3. Continuation of the experiment with four of the monkeys for 20 more days at a dosage of 2.5 mg/kg per day evinced only two instances of vomiting during the entire period, and all animals appeared clinically well. However, using somewhat higher doses on a new group of three monkeys gave different results:

		MMH dose, mg/kg			
Monkey	Day:	1	2	3	4
1		7	10*		
2		7	10	7*	
3		7	10	7	10*

*died

No sign of illness was observed in any animal on day 1. Perhaps many a gyromitra eater has run closer to the ragged edge than he realized.

Claims of poisoning from exposure to the vapors evolved during cooking of *G. esculenta* are possible, as MMH boils at 87.5°C.

Although most clinical signs of illness are negative for animals receiving small doses of MMH, Reynolds and Back[39] demonstrated that trained Macque monkeys were temporarily impaired in their ability to perform complex tasks after receiving doses as low as 2.5 mg/kg. Even more sobering are reports that hydrazine (no data on MMH) is tumorigenic in mice.[40, 41]

Treatment

The first symptoms of gyromitra poisoning, nausea and vomiting, usually appear within 6-8 hours after consumption; diahrrea may or may not be present. There is usually no difficulty in establishing the species responsible as the victim himself is well aware of what he has eaten and may refer to *G. esculenta* by some such common name as "beefsteak," "elephant ears," "false morel," or "lorchel." Involvement of the *A. phalloides* group is not possible because of the time of year. Methemoglobin levels may provide the best indication of the degree of poisoning. For additional symptoms see Mittman.[37]

Dale et al[36] recommend the following steps in protection against poisoning by hydrazine and its methyl derivatives: anesthetization to protect from the consequences of convulsions, but with proper regard to the fact that the respiratory center may already be depressed; injection of pyridoxine to counteract inhibition of B_6-dependent enzymes; maintenance of normal blood glucose levels (high sugar levels may be observed immediately after poisoning, but eventually hypoglycemia sets in); maintenance of blood volume and kidney function to facilitate excretion; and maintenance of body temperature by heating or cooling as required.

Azar et al[42] propose administration of pyridoxine hydrochloride (25 mg/kg) and sodium phenobarbital as treatment for poisoning by "Aerozine-50," a 50/50 mixture of hydrazine and dimethylhydrazine. Physicians concerned with treatment of serious gyromitra poisoning should consult this paper.

A different therapeutic approach was used by Mittman[37] with a 9-year-old child seriously poisoned after a second meal of *G. esculenta.* Because the child was comatose and the outlook poor, Mittman began dropwise infusion of thioctic acid at 150 mg/day merely because such treatment had been recommended for *A. phalloides* intoxication. He reported a surprising response and attributed the recovery to the use of thioctic acid. This interesting result bears further investigation.

3. Inocybe and Clitocybe Species

Many inocybe species contain muscarine (Figure 6) and muscarine isomers. Eugster[43, pp. 272-3] presents a list of muscarine analyses for 31 species and 14 unidentified specimens compiled from various sources; some species contain more than 1% muscarine on a dry weight basis. Catalfomo and Eugster[44] have found that muscarine isomers predominate in some inocybe species; although these isomers possess less muscarinic action than muscarine itself, they may be toxic in other respects. Genest et al[45] have reported the presence of muscarine in *Clitocybe dealbata, C. cerussata, C. rivulosa* and *C. illudens. C. dealbata* grows in lawns, and inocybes may appear under shrubs and trees in proximity to houses. They are therefore likely to be eaten by young children.

Muscarine is a powerful cholinergic drug stimulating the parasympathetic nervous system. Fortunately, it is poorly absorbed from the intestinal tract or fatalities would be more frequent. The symptoms normally appear within one-half to two hours after ingestion and include miosis, blurred vision, sweating, salivation, lachrimation, bradycardia, increased peristalsis, reduced blood pressure, congestion of the pulmonary circulatory system, and asthmatic breathing. The specific antidote for muscarine is atropine, administered carefully according to the size and condition of the patient. Webster and Pickering[46] describe treatment of a child with most of the symptoms of muscarine poisoning (pupils dilated, however) but with convulsions so severe that curare and intermittent positive pressure respiration were required to control them.

4. Amanita Muscaria and A. Pantherina. History, Mycology and Chemistry

Few deaths have been recorded from *A.*

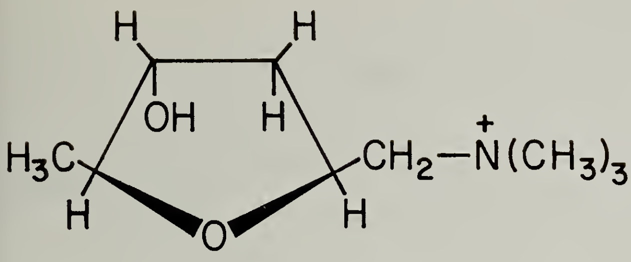


Figure 6. Muscarine

muscaria or *A. pantherina*, and those that have been recorded involved mainly children or persons already organically ill. Until recently these mushrooms were universally portrayed as deadly poisonous, but it is now known that they have been used extensively by primitive peoples for their psychoactive effects. Wasson[47] has argued convincingly that *A. muscaria* was the magic "soma" of the ancient Aryan peoples, used by them as a sacred inebriant and much praised and glorified in several hundred hymns in the Rig Veda. Biblical scholar John M. Allegro[48] has written a book defending the thesis that Judeo-Christianity had its origins in a cult of *A. muscaria* worshipers, but, somewhat predictably, this work has not been well received. Use of *A. muscaria* in religious rites continued into this century in western Siberia among the Ostyak and Vogul and in eastern Siberia among the Kamchadal, Koryak and Chukchi. In any event intoxication by these mushrooms seems to be characterized by strong religious overtones. Hotson and Lewis[49] quote a woman intoxicated with *A. pantherina* who imagined herself in hell although without unpleasant reaction: "In fact, it didn't appear as bad a place as some people would have us believe."

The European and western US variety of *A. muscaria* is a mushroom beautiful beyond description. The gills and stipe with its ample, membraneous annulus are pure white, and the large cap, sometimes a foot in diameter, is brilliant red and covered with patches of white tissue, the remnants of the volva. Our Delaware variety is somewhat less glorious, the caps being cream to bright orange but never red. In this area it is partial to conifer plantings, but is not so limited. *A pantherina* is a similar fungus, but the caps are brown; it apparently does not grow east of the Rocky Mountains.

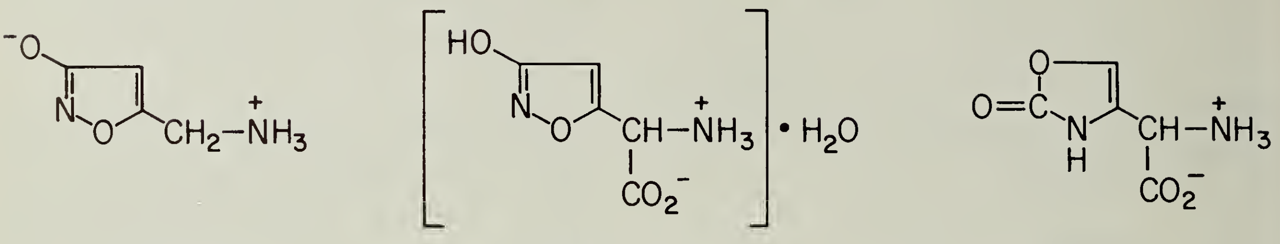
The chemical constituents of these amanitas have been extensively studied by Eugster.[43] The psychoactive principles known to date are muscimol, ibotenic acid and muscazon (least active; not yet found in *A. pantherina*). (Figure 7) Muscarine, isolated from *A. muscaria* in 1869, is present in such minute amounts (0.00025% of fresh tissue) that it is not responsible for any physiological effects. Papers claiming detection of tropane alkaloids (atropine, hyoscyamine, and scopolamine) have been criticized by Eugster and others, who conclude there is as yet no firm evidence that these alkaloids occur in fungi.

Toxicology

The pharmacological and psychological effects of muscimol and ibotenic acid have been investigated by Theobald et al[50] and Wasser.[51] Neither drug evoked the typical hallucinogenic syndrome characteristic of LSD, psilocybin or mescaline, and neither reproduced the exact symptoms of *A. muscaria* intoxication. Muscimol was some five times more active than ibotenic acid, and 7.5-10 mg orally was an active dose. The symptoms began approximately one hour after ingestion and included muscular uncoordination and twitching, indolence and indifference, fluctuating moods, inability to concentrate, dreaminess, a sense of unrealness and leaving one's body, space distortion, unawareness of time, and vision disturbed by echo-pictures. Hallucinations, vivid color perception, and a sense of time-standing-still were not experienced. Muscimol is quite toxic — $LD_{50} = 2.5$ mg/kg (ip) for mice and 3.5 mg/kg (ip) for rats.

Scotti de Carolis et al[52] found that muscimol-treated rabbits exhibited EEG patterns distinct from those produced by other hallucinogens and comparable in some ways to those produced by atropine or scopolamine. Small doses of pentobarbital or diazepam administered to muscimol-treated rabbits evoked patterns similar to those found in deep anesthesia, and the animals lapsed into a state of flaccid paralysis.

Figure 7. Constituents of Amanita muscaria



Muscimol

Ibotenic Acid

Muscazon

Muscimol, ibotenic acid and LSD induced a generalized increase in brain serotonin in rats; however, the catecholamines decreased with muscimol and LSD but increased with ibotenic acid.[53]

The psychoactive compounds in *A. muscaria* are probably not metabolized by the body. Primitive peoples were aware that the urine of intoxicated persons (and animals) was quite suitable for a "second-hand" kick. Thus it appears that the perpetual pill was invented long before Paracelsus.

Treatment

Atropine exacerbates the toxic effects of muscimol and ibotenic acid and should not be administered. Recommendation of its use in older literature was based on the mistaken belief that muscarine was the principal toxin in *A. muscaria* and *A. pantherina*. The potentiation of sedatives and tranquilizers by muscimol[52] should be borne in mind. I found no reference to use of chlorpromazine for terminating unpleasant psychic experiences.

5. *Psilocybe, Conocybe, Panaeolus and Stropharia Species*

At least 25 species scattered throughout these four genera are known to contain psilocybin and psilocin (Figure 8), and the use of these mushrooms for their hallucinogenic effects stretches back for centuries. All four genera are represented in Delaware mycoflora. A particularly common species is *Panaeolus foenesecii*, and one may find dozens of specimens at a time growing in lawns. The psilocybin content of *P. foenesecii* varies according to region, however, and its presence in our Delaware specimens has not been established.

The modern-day physician is much more likely to see individuals intoxicated by synthetic psilocybin rather than the natural product. In general no treatment is required; chlorpromazine may be used to terminate the hallucinations.[54]

6. *Coprinus Atramentarius*

Consumption of alcohol some hours after a meal of *Coprinus atramentarius* evokes the well known alcohol-disulfiram (Antabuse, tetraethylthiuram disulfide) syndrome. In spite of the essential identity of the symptoms, disulfiram has not been detected in *C. atramentarius*, and the active agent remains unknown.[55] Curiously, raw mushrooms do not produce the effect.

Victims previously unaware of the possibility of this type of poisoning will be greatly alarmed and possibly hysterical. No specific treatment has been recommended.

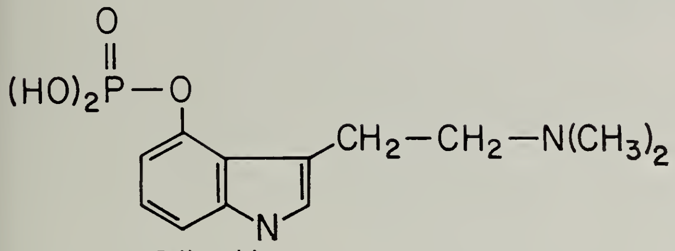
Poisoning by other species of mushrooms when alcohol was taken with or shortly after the meal have been reported.[56,57] The symptoms do not resemble those of alcohol-disulfiram intoxication, however, and may result from increased solubility and absorption of some normally unassimilable substance.

Conclusion

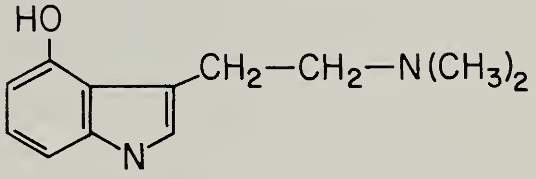
It must be emphasized that the only persons who can expand their gastronomical horizons with wild mushrooms in safety are those who study the fungi sufficiently to become familiar with the characteristics of the edible and poisonous species. Simple tests, such as the ease of peeling or the blackening of silver coins cooked with the mushrooms, bear no relationship to the presence or absence of toxins.

Figure 8.

Hallucinogenic compounds present in many species of Psilocybe, Conocybe, Stropharia and Panaeolus



Psilocybin



Psilocin

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Even in an effort as modest as this, I have become indebted to a substantial number of persons. I wish particularly to thank Adolf W. Fogiel, Ph.D., for his assistance in translating Polish and Alex Azar, M.D., for supplying information and references on poisoning by hydrazine compounds.

ATHEROSCLEROSIS: A DISCUSSION OF ITS CAUSE AND TREATMENT

• **The evidence of a relationship between atherosclerosis and predisposing factors including mechanical, hemodynamic, biochemical, hormonal, dietary, environmental, genetic, and psychological factors is reviewed. A five-part classification of the hyperlipidemic state is outlined and correlated with specific programs for diet and drug therapy.**

Leslie Wiener, M.D.

The appalling toll exacted on our western civilization by the atherosclerotic process is witnessed by the fact that coronary heart disease is the chief single cause of death in the United States.[1] This year it is anticipated that 650,000 Americans will die of coronary artery disease. The magnitude of this progressing problem has resulted in a phenomenal increase in fundamental and clinical research designed to combat atherosclerosis. In spite of the great strides made, the pathogenesis of atherosclerosis continues to be obscured by lack of suitable experimental models. The relationship as well as the importance of mechanical and hemodynamic factors to biochemical, hormonal, dietary, environmental, genetic and psychologic factors continues to be primarily speculative. Consequently, current concepts of management, whether prophylactic or ameliorative, remain in large measure a subject of continuing investigation.

Editorial comments appear on page 201

The task at hand will be to examine a few of the major contributions to our knowledge of atherosclerosis and its treatment. The gaps in our understanding should serve to emphasize that until the basic nature of this disorder is clarified, atherosclerosis will remain the number one medical problem in the western world.

Many factors appear to be involved in the pathogenesis of atherosclerosis. Their degree of involvement is not yet fully assessed. They may, however, be classified into two groups, primary and secondary. Disturbed lipid metabolism, and alterations in arterial metabolism, and intimal permeability are commonly considered in the primary group. Arterial hypertension, hydraulic phenonemon, the influence of hormones, and age constitute some of the secondary factors. The basis for the current view implicating cholesterol and lipids in the causation of atherosclerosis is the presence of these substances in the atheromatous lesion examined by histochemical studies. Antischkow and Chalatow[2] and Ignatowski[3] were the earliest investigators to record the relationship of elevated cholesterol to atherosclerosis. These workers related increased blood lipid levels induced by diet modification to accelerated atherosclerosis in rabbits. Page[4] popularized the filtration concept of atherogenesis, which indicates that blood lipids enter the arterial endothelium. After a variable period of time, these lipids accumulate on the arterial wall and secondary tissue reaction occurs which results in thickening of the intima. C^{14} cholesterol and I^{131} fatty acid tracer studies as well as electron microscopic analysis of arteries by Hess and Stauble[5] offer documentation for this theory.

Susceptibility to Atherosclerosis

Studies by Haimovici and Maier[6] strongly

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suggest that susceptibility to atherosclerosis is an inherent biological property of the arterial tissue *per se.* Accumulating evidence indicates that the arterial wall is an organ capable of metabolic activity. The oxidative capacity of the cyotochrome oxidase system is seen to first decrease, then increase, then increase again in the preatherosclerotic, early, and late phases of atherosclerosis respectively.

In addition to varying metabolic activity of different portions of the arterial system, irregular distribution of atherosclerosis may result from the effects of variations in stresses and strains imposed by altered hemodynamic mechanical factors. Based upon the application of hydrodynamic laws to physiology, Texon[7] has shown that intimal thickening should occur along the inner side of curves, and downstream from bifurcations at points where arteries are fixed in position. *In vivo* experimental studies by Gyurko and Szabo[8] have substantiated many of these fluidic mechanical principles.

It has been firmly established in epidemiologic retrospective and prospective studies that an increase in lipids, especially serum cholesterol, is a major risk factor for coronary heart disease.[9-17] These studies have shown that the risk for recurrence of an acute coronary episode is three to four times greater for a subject with a high serum cholesterol (over 260 mg per 100 ml) compared to a subject with a low serum cholesterol (less than 220 mg per 100 ml). Recently, Fredrickson, Levy and Lees[18] have developed a convenient system for classifying patients with hyperlipidemic states. Their method, based upon electrophoretic separation of plasma lipoproteins, could throw new light on the entire subject.

Categories of Lipoprotein Abnormalities

Five basic categories of lipoprotein abnormalities have been recognized. Type I is a rare exogenous hyperlipidemia presumed to result from a deficiency of postheparin lipolytic activity involving lipoprotein lipase. The serum cholesterol and triglycerides are both elevated, and the plasma appears milky because of the presence of chlyomicron. Hepatosplenomegaly and abdominal pain are frequent accompaniments. Type II disease is very common and is often associated with premature coronary atherosclerosis. It is inherited as an autosomal dominant trait. Its lipoprotein electrophoretic characterization is based upon a selective increase in the beta-lipoprotein fraction. The serum cholesterol is elevated without hypertriglyceridemia. The time of onset of coronary heart disease in this group is often determined by the height of the serum cholesterol level. Type III or "Broad beta disease" is recognized when pre-beta and beta lipoproteins are elevated to approximately the same degree. Both serum cholesterol and triglyceride concentrations are significantly elevated. Type IV is due either to carbohydrate-induced overproduction or to delayed clearance of endogenous glycerides. The electrophoretic pattern shows a predominant increase in pre-beta lipoproteins. Serum triglyceride is elevated but cholesterol may be normal. The majority of these patients have abnormal glucose tolerance tests and hyperuricemia. Type V, a combination of Types IV and I, is very rare and is both carbohydrate- and fat-induced.

The association between hypertension and atherosclerosis has been known for a long time. The Framingham study[19] found that in men 30-59 years of age at the onset of the study, the occurrence of new coronary episodes was four and one-half times higher in those with a systolic blood pressure over 180 mm of mercury than in those with a systolic pressure of less than 120 mm mercury. Bronte-Stewart and Heptinstall showed that an atherogenic diet in animals, and elevation of the arterial blood pressure accelerated lipid deposition in the arterial wall.[20]

The Importance of Hormonal Factors

The importance of hormonal factors is attested to by the striking difference in incidence of coronary heart disease between premenopausal females and males of comparable age.[19] Approximately eight years following menopause, the risk for coronary heart disease is slightly though not significantly higher in females than males of comparable age. Additional evidence of the importance of a hormonal role in atherosclerosis is the well established incidence of accelerated arteriosclerosis in diabetic patients.[21-29] Pathologic studies of large groups of patients have shown that coronary heart disease is twice as frequent in diabetic males and three times as frequent in diabetic females as in nondiabetic subjects. Moreover, the critical course of coronary heart disease in diabetic patients is apt to be more severe and the progression more rapid than in nondiabetic patients. Herman and Gorlin[30] have stressed the importance of diabetes mellitus, even in mild form and manifested only by a positive glucose tolerance test, as an important factor leading to the early development of coronary artery disease. As noted previously, these carbohydrate intolerances are associated frequently with hypertriglyceridemia

In the past ten to fifteen years, a number of epidemiologic studies have shown that the incidence of atherosclerosis is higher among those who present with a positive family history.[31-35] The familial tendency of atherosclerosis is probably explained by the familial occurrence of other factors such as hypertension, diabetes, genetically determined arterial geography, hyperlipidemia and environmental factors in which diet, physical activity, cigarette smoking, and emotional stress play an important role.

A Program to Prevent or Control Atherosclerosis

Enough information has been accumulated on the multiple constitutional and environmental factors associated with atherosclerosis to suggest appropriate countermeasures, albeit empirical and of still unproved effectiveness. Candidates for a program designed to prevent or control atherosclerosis require in addition to thorough history and physical examination: 1) a proper categorization of their lipid profile, 2) determination of glucose tolerance and blood uric acid levels, 3) institution of a therapeutic program designed to modify elements of their life style, including cigarette smoking, physical activity, and diet. The safest and possibly the most effective long-range program for the treatment and prevention of hyperlipidemia is the use of an appropriate diet. In keeping with the data supplied by Fredrickson and colleagues,[18] the National Heart and Lung Institute has compiled diets specific for the five hyperlipidemic categories. Types I and II respond best to low fat-low cholesterol diets, whereas Types III and IV respond well to low calorie-low carbohydrate diets. Type V is controlled as a mixed Type I and Type IV group. In all cases, diets are established at a calorie level which will maintain the patient at a desired weight. In general, saturated fat is substituted with unsaturated, and simple sugars and starch are replaced by complex carbohydrate substances. Except for more severe cholesterol restriction imposed in the Type II diet, cholesterol is moderately restricted to 300 to 500 milligrams per day. If after an interval of three months one finds that dietary measures alone have been unsuccessful in achieving normal lipid values, then drug therapy can be undertaken. D-thyroxin in a dose of 4 to 8 mg per day is effective in those individuals with hypercholesterolemia as a primary abnormality.[36-37] At present, this drug should probably be used only in the absence of clinically manifest coronary heart symptoms, because elements of racemic thyroxin effect persist. Clofibrate in a dosage of 2 grams to 4 grams per day is particularly effective when both triglyceride and cholesterol fractions are elevated to approximately the same degree.[37] Nicotinic acid in a dose from 3 to 6 grams per day is a moderately effective hypocholesterolemic agent.[38] Its mode of action is unknown, and in higher doses it causes pronounced flushing, dyspepsia and mild liver dysfunction. Cholestyramine in doses of 12 to 24 grams per day interrupts enterohepatic resorption of bile salts and cholesterol.[39,40] Its effectiveness in reducing high levels of cholesterol is frequently limited by its unpalatable taste.

It should be emphasized that many of the major risk factors, including smoking, lack of exercise, hypertension, diabetes, diet and hyperlipidemia can be successfully treated and adjusted to a desired level. While no firm documentation exists acknowledging the value of these regimens, prospective studies presently underway offer hope that correction of these risk factors can reduce or postpone premature atherosclerosis.

Owing to the length of Doctor Wiener's bibliography, it has not been published in the Journal with his review but is available on request.

DELAWARE AND THE REGIONAL MEDICAL PROGRAM

What is the future of RMP in Delaware?

EDGAR HARE, JR.

The Greater Delaware Valley Regional Medical Program (GDVRMP) comprises eastern Pennsylvania, all of Delaware and southern New Jersey, with headquarters in Haverford, Pa. The five colleges of medicine and the college of osteopathic medicine in Philadelphia are active participants.

The Delaware Area, consisting of the three Delaware counties and Salem County, N.J., is one of six sub-regions of GDVRMP and participates through a large and representative Area Wide Committee.

For about a year a number of groups have been discussing methods of achieving improved and coordinated health planning and delivery activities in Delaware, including the most effective way to exploit the resources of the Regional Medical Program. The discussion, as regards RMP, has centered largely around the possibility of withdrawal from the Greater Delaware Valley Regional Medical Program and the establishment of a State Regional Medical Program. A summing-up seems appropriate and, consequently, there are set forth below the chief arguments presented for withdrawal and responses thereto.

ARGUMENT: The Delaware Area has fared poorly with respect to the approval and funding of operational projects. If the RMP Region had been limited to the State of Delaware, the results would have been better.

RESPONSE: The Delaware Area has fared quite well with respect to approval of operational projects. Five such projects have achieved Area, Regional and Federal approval. While all were not funded, financial support of three of the five projects can be attributed directly to the Area's being a part of GDVRMP. Direct funding of all five projects was withheld at the federal level, and the three funded Area projects have been financed by the Region out of its planning monies. It is purely speculative and extremely doubtful that the Area's record on operational projects would have been any better or as good had it not been a part of GDVRMP.

In view of reduced national appropriations to RMP there is no reason to believe that future operational projects will have any better chance under the GDVRMP.

ARGUMENT: More effective effort in the planning and delivery of health care can be achieved in Delaware if the Regional Medical Program is limited to the state, officially coordinated with other efforts and placed under central direction, possibly the Department of Health and Social Services.

RESPONSE: There is a rather broad consensus that improved coordination with centralized direction of health planning and delivery activities is desirable. That this can be achieved through withdrawal from GDVRMP is questionable. The Delaware Area Wide Committee has not only offered its fullest cooperation, but it actually took the initiative in approaching other concerned groups with the thought of better inter-group working relationships. The Area Wide Committee is the most representative health-related group in the Area, and it seems obvious that by maintaining its official ties with extensive Regional resources it can offer more to a coordinated

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effort than would be possible if it were limited to state boundaries or disbanded. As a part of GDVRMP, the Area Wide Committee represents a resource that can be tapped and is entirely willing to be a part of a state coordinated effort.

It should be of some concern that Salem County, New Jersey, not be sold down the river. Health and medical care of Salem County has ties with Delaware and with the Greater Delaware Valley Region which, in the nature of geographical, medical and social conditions, will have to be maintained in some way. However, if Delaware should break off as a separate RMP, Salem County's relationship with GDVRMP through the Delaware Area Wide Committee would be short-circuited.

ARGUMENT: Delaware needs administrative funds to staff its planning and delivery and a goodly portion of such funds could be obtained for the state through its own RMP.

RESPONSE: Additional administrative funds are highly desirable and, perhaps, necessary. That they would be obtained in sufficient quantity through a state RMP is doubtful. While the amount of money that might be made available for a Delaware RMP would probably remain unknown until a grant application had been submitted and acted on, the probability of obtaining a significant allocation is questionable given the cuts in appropriations that the federal Regional Medical Program Service has been subjected to and the reductions in grants that have been passed on to the Regions nationally. It would not seem wise to sacrifice the advantages of affiliation with a large Region until and unless it is certain that the possible gains would outweigh the certain losses.

ARGUMENT: There is no dearth of expertise and talent in the state of Delaware. Consequently, it is unnecessary to go outside the state for any assistance in planning or implementation. Since these persons have full time occupations, all that is required is to obtain funding for staff in order to free the talent and expertise to operate at an appropriate level.

RESPONSE: There is no doubt that Delaware has a wealth of talent and expertise. As indicated in the argument, however, practically all of it is engaged full-time in some primary activity which limits its contributions to planning activities and the implementation of plans to a volunteer, extra-curricular basis. Without adequate staff, as indicated in the argument, this talent bears the extra burden of detail work that staff could and should perform. But even with staff, the experts would remain volunteers required to apply their expertise on their own time which most of them have very little of. Even if—and this is doubtful—a State RMP would provide funds to hire knowledgeable professionals, recruiting them in today's highly competitive market would be difficult and perhaps impossible.

Available Services

In the GDVRMP Haverford-Philadelphia axis (the core staff and the medical schools) there is a cadre of talent and expertise, salaried by RMP, that is available to the Region as a whole and to all Areas of the Region. Consultants not salaried by RMP can also be made available through the GDVRMP structure. It is obvious that the variety and concentration of expertise represented by GDVRMP, including Delaware, exceed that represented by the State of Delaware alone. And when one considers that much of it is already "staff," it represents a resource that should not be dismissed without assurance of a counterbalancing resource of greater weight.

There has been some feeling that the "outreach" of the Regional core has left something to be desired. There are perhaps three reasons for this. First, when the emphasis was on operational projects—and funding problems were not anticipated—local and Area responsibility, with Regional help available as requested, produced quite good results, especially in this Area. Second, with the transition from operational projects to some different emphasis, which still remains unclear even at the federal level, the Region has understandably not known quite what it ought to reach out with. Everybody hopes for an early and clear resolution of this problem. Third, in any circumstances the Region hesitates to appear to impose its views and plans on the Areas (knowing that an appearance of imposing would arouse hostility) and has refrained from attempting to institute activities which any given Area might at the moment not be at all interested in. It is apparent that as RMP functions become clarified GDVRMP proposes to be somewhat more aggressive in its outreach but, where sub-Regionalization has been instituted to provide a maximum of local input, as in GDVRMP, great reliance on Area initiative will be maintained, supported by Regional assurance of help as required, possibly including financial planning grants within budget limitations.

It would be difficult to demonstrate that withdrawal from GDVRMP would improve the State's situation with respect to the availability of talent and expertise.

ARGUMENT: Geography, political boundaries and distance make it impractical for the Delaware Area to maintain any effective working relationship with Haverford and Philadelphia.

RESPONSE: With respect to communication and transportation this argument is so outmoded as to require no response. With respect to political boundaries, the argument is becoming, if it is not already, outmoded. True, state boundaries do affect the organizational structures of many entities and do prescribe the limits of certain governmental functions. Also, they are not without significance in relation to health affairs for not only government but also such organizations as medical societies, voluntary health organizations and many more operate basically within political boundaries. However, it seems obvious that such boundaries are impediments to effective health and medical care and that efforts should be directed toward removing these impediments rather than strengthening them. It seems rather certain, anyway, that trends are toward breaking artificial boundaries and that movements in the opposite direction are doomed ultimately to failure. Provincialism and parochialism will do more to deter the improvement of health of all people than improve it. The best efforts should be in the direction of taking the maximum advantage of regionalization rather than retreating into the past and wrapping ourselves in the cocoon of the state boundary.

ARGUMENT: Continuing affiliation with the Haverford-Philadelphia centered RMP, including the sophisticated and highly specialized medical services in the medical school-related hospitals, will have a deterrent effect on Delaware's health planning and implementation. The continued reliance on Chester, Philadelphia and Baltimore for such specialized medical services as hemodialysis and home dialysis training programs, cardiac catheterization laboratories, open heart surgical services, facilities for tissue typing, etc. has had the effect of retarding the development of such services in Delaware with the result that the state has short-changed itself. It has been stated that these are "purportedly" but not actually convenient geographic locations with relation to the state's populace. The assumption, which may be true, that all persons needing specialized care of these types are not being referred to those distant specialized facilities is given as evidence that Delaware's existing health care delivery system has been noticeably weakened.

RESPONSE: It may be true that Delaware as some sort of an entity may have been short-changed by not developing some highly sophisticated services within its own boundaries. It might be argued, though, whether or not anything more serious than local pride has been damaged. The question at issue is, or should be, how to get the best medical care for the people of the state in the most economical fashion. The existence of an imaginary line that has substance only on a map should have no place in this consideration. To label Philadelphia and Baltimore as "distant" is as unrealistic in this connection as in relation to the argument immediately above. If planning is, as it should be, for the future, it should consider that distance will have increasingly less meaning as speeds increase and modes of conveyance and general mobility improve. Will it, then, make sense to duplicate and attempt to man facilities for highly specialized services, at astronomical costs, when these services will exist almost literally next door and can, through proper planning and management, be made accessible to Delawareans?

The claim that all persons needing specialized care are not receiving it is an argument for something but clearly not for duplicating those services in Delaware. It is just as true that all persons needing elementary primary medical care are not receiving it. While lack of care, both specialized and primary, calls for remedial measures, the remedies would not appear to lie in the duplication of nearby specialized services.

Here again the forward-looking approach would appear to be toward gaining the maximum benefits of regionalization rather than retreating into a possibly self-defeating provincialism.

Argument: Since Delaware is small and compact with a diversified population, by bringing everything, including the RMP, into the state under centralized direction, a health planning and delivery system can be developed that will serve as a model for the entire country.

Response: This appears to be a specious argument. Theoretically, and perhaps ideally, it may be so; it has been said many times in many connections and even attempted, but one would be hard put to produce an actual, successful example. It may be worth trying in the health and medical care field, and it may work. Its success, however, seems doubtful in this small and ever shrinking world where it becomes more and more difficult to exist in isolation.

But even if Delaware is determined to create a state-centered model of health planning and delivery, it would not seem to require the breaking of all ties with the outside and relinquishing those advantages that would accrue to a maximum utilization of the Delaware Area Wide Committee and its affiliation with GDVRMP. As pointed out earlier, the state can expect the full cooperation of the Area Wide Committee including the resources available to it through GDVRMP.

And might it not be even more significant if Delaware can become the model of how a state can provide the best health and medical care for its citizens, both by coordinating its own internal activities and utilizing to the fullest extent the aids and resources that are available regionally and nationally? Continuing affiliation with and participation in the Greater Delaware Valley Regional Medical Program could provide a meaningful assist in this kind of effort.

* * *

Out of Season
Cape Henlopen

Two photographs by
Richard Lennihan, Jr., M.D.

ATTENTION — ALL PHYSICIANS TREATING MINORS

THE FOLLOWING LEGISLATION RECENTLY ENACTED SHOULD BE OF INTEREST TO YOU. IT IS NOW LAW.

HOUSE BILL NO. 377

AN ACT to amend Title 13, Section 707, Delaware Code, relating to health care of minors

BE IT ENACTED by the General Assembly of the State of Delaware:

Section 1. Section 707, Title 13, Delaware Code, is amended by striking said section in its entirety and inserting in lieu thereof a new Section 707 to read as follows:

"§ 707. Consents to health care of minors

(a) Consent to the performance upon or for any minor by any licensed medical, surgical, dental or osteopathic practitioner, or any hospital or public clinic, or their agents or employees, of any lawful diagnostic, therapeutic or postmortem procedure, and to the furnishing of hospitalization and other reasonably necessary care in connection therewith, may be given by:

(1) a parent or guardian of any minor for such minor;

(2) a married minor for himself or herself, or if such married minor be unable to give consent by reason of physical disability, then by his or her spouse;

(3) a minor of the age of 18 years or more for himself or herself;

(4) a minor parent for his or her child;

(5) a minor, or by any person professing to be serving as temporary custodian of such minor at the request of a parent or guardian of such minor, for the examination and treatment of (i) any laceration, fracture, or other traumatic injury suffered by such minor, or (ii) any symptom, disease, or pathology which may, in the judgment of the attending personnel preparing such treatment, if untreated, reasonably be expected to threaten the health or life of such minor; provided, however, that the consent given shall be effective only after reasonable efforts shall have been made to obtain the consent of the parent or guardian of said minor;

(b) Any consent given by or for a minor pursuant to the authority of any provision of this chapter shall be valid and effective for all purposes, and, notwithstanding any misrepresentation as to age, status as parent, guardian or custodian or as to marital status, made to any practitioner, hospital, or clinic for purposes of inducing the furnishing of health care to such minor, shall bind such minor, his parent, spouse, heirs, executors and administrators, and shall not be subject to subsequent disaffirmance by reason of minority.

(c) Nothing contained in this section shall be construed to relieve any practitioner, hospital, clinic or their agents or employees from liability for negligence in diagnosis, care and treatment, or for the performance of any procedure not reasonably required for the preservation of life or health."

* * *

BEACH GRASS
CAPE HENLOPEN

HEALTH LEGISLATION OF INTEREST TO MEDICAL SOCIETY OF DELAWARE

To briefly review, a bill introduced in the General Assembly must pass both houses of the Legislature in the same form.

Most legislation dealing with health and medical care is assigned to either the Senate Committee on Health and Social Services, chaired by Senator Louise Conner, or the House Committee on Health and Social Services, chaired by Representative Daniel Weiss, with Representative Thomas Little, Chairman of the Health Subcommittee.

Delaware's 126th General Assembly completed its first regular session on June 30. The following is a listing of some of the legislation with significance for medicine considered in the recent session of the General Assembly. Bills not yet enacted into law can be considered at the next regular session, which will convene in January 1972. If a bill has passed one house in this session, passage by the other house in the next session will make it law unless a gubernatorial veto should deem otherwise. Allston J. Morris, M.D. is Chairman of the Public Laws Committee, which considers health legislation and makes recommendations to the Board of Trustees of the Medical Society of Delaware. For further information or a copy of any of the bills listed contact the Society office, 658-7596 or 652-6512.

BILL	TITLE — SUBJECT	SOCIETY POSITION	CURRENT STATUS
H.S. 1 for H.B. 30	Relating to reporting of cases of child abuse (Introduced by Representative Seibel)	Supported	Signed into law by Governor 6/25/71
S.B. 44	Supplementary appropriation to Crippled Children's Section of the Division of Physical Health (Conner)	Supported	Approved by Governor 2/5/71
S.S. 1 for S.B. 87	Establishing an educational program for physicians' assistants under the jurisdiction of the Board of Trustees of the Delaware Institute of Medical Education and Research and certification by the Medical Council of Delaware (Hale)	Did not support; preferred provision for physician's assistant through the Medical Practice Act	In Senate Health and Social Services Committee
H.B. 87	Providing for immunity of the Osteopathic Examiner of the Medical Council (Quillen)	Supported	Signed into law by Governor 4/30/71
S.B. 100	An act to establish a Family Court for the State of Delaware (Manning)	Supported	Signed into law by Governor
S.B. 101	Relating to the jurisdiction of certain courts over children 16 or 17 years old charged with violations of the Motor Vehicle Laws (Manning)	Supported	Signed into law by Governor
S.B. 102	Concerning the jurisdiction of the Family Court and transfer of cases from Superior Court to Family Court (Manning)	Supported	Signed into law by Governor
H.B. 102	Establishing .08 as Blood Alcohol Level at which Driving or Physical Control of a Motor Vehicle Is Unlawful (Present level is .10) (Billingsley)	Supported	Reported out of House Public Safety Committee

H.B. 104	Providing for health insurance, group health insurance, blanket health insurance and health service corporations to be subject to Delaware Code regarding rates (Little)	Took position of "no position"	In House Health and Social Services Committee
S.B. 141/ S.A. 1	To authorize release of autopsy results to the immediate family (Elliott, Steele)	Supported	Approved by Governor 5/6/71
H.B. 198	To provide for the licensing and regulation of rates charged by hospitals (Dillman, Little, and others)	No action taken	In House Health and Social Services Committee
H.B. 216/ H.A. 3, 4	Relating to the labeling of pharmaceutical prescriptions (Little)	Supported in principle by Public Laws Committee	Passed both houses 6/28/71
S.B. 230	Requiring the Use of Safety Glazing Materials in Hazardous Locations in residential, industrial, commercial or public buildings as a means of protecting the public against death and injury caused by splintered glass (Steele)	Supported	Signed into law by Governor 5/20/71
S.B. 238	An act adopting a Housing Code for the State of Delaware, establishing minimum standards (Manning)	Supported	In Senate Community Affairs Committee
H.B. 254	To repeal all laws against selling contraceptives (Billingsley)	Supported	Signed into law by Governor 7/71
S.B. 255	To exempt certain firemen, policemen and volunteer ambulance and rescue squad personnel from civil liability when rendering emergency care, first aid and rescue in the performance of their official duties except in certain instances (Cicione)	Supported	Signed into law by Governor 6/2/71
S.B. 263	To amend the State Constitution to abolish the office of coroner (Steele)	Supported	Signed into law by Governor 6/2/71
H.B. 285	Relating to the Public Health and Safety with particular reference to persons totally or partially blind (Little, Kirk)	Supported	Signed into law by Governor 7/71
S.B. 292/ H.A. 1	To provide that the Superintendent of the Governor Bacon Health Center be qualified in the field of child and adolescent psychiatry or psychology with administrative experience (Isaacs, Conner)	No position	Signed into law by Governor 6/12/71
H.B. 305	An act making supplementary appropriations to the Department of Health and Social Services and the Department of Public Safety for funding an expanded anti-drug-abuse program (Little and others)	Supported	Passed both houses
S.B. 333/ S.A. 1	An act to amend Delaware Code Relating to physical therapy (Steele)	Amendment was put on at Society request to make the bill more palatable	Passed Senate; now in House and Social Services Committee

BILL	TITLE — SUBJECT	SOCIETY POSITION	CURRENT STATUS
H.B. 344	To put a physician on the State Fire Prevention Commission (Hering, Dillman)	Supported	Reported out of House Health and Social Services Committee
S.S. 1 for S.B. 358	To provide for the rendering of health services by assistants to physicians (Hale)	The Society supported the part providing for physicians' assistants but not the part referring to their use by ophthalmologists and optometrists	Signed into law by Governor 7/71
H.B. 372	Providing for immunity of members of medical society committees whose function is the review of medical records and of physicians' work with a view to quality of care and utilization of hospital facilities, home visits, and office visits (Quillen)	This bill was introduced at the request of the Medical Society of Delaware	Signed into law by Governor 7/71
H.B. 377/ H.A. 1	Relating to consent to health care of minors (See page 195 for complete text) (Seibel, Wright)	Did not consider	Signed into law by Governor 7/13/71
S.S. 1 for S.B. 410	An act to establish a Delaware Voluntary Formulary Advisory Board, to develop a Delaware Formulary for Voluntary Use, and to Promote the availability of high quality drug products at reasonable cost (Conner)	Supported the voluntary formulary concept	Passed Senate; in House and Social Services Committee
H.B. 411	To provide a drug education program in the schools (Little and others)	Supported in principle	Passed both Houses 6/24/71
S.B. 427	Relating to licensing of drug care centers, drug counselling centers, drug educational or drug abuse prevention services, and drug treatment or rehabilitation facilities (Manning)	Supported in principle	Reported out of Senate Health and Social Services Committee
S.B. 448	Providing that Superintendent of any mental health institution may consent on behalf of any patient therein where relative of patient cannot be located for surgical or medical therapeutic procedure needed by patient (Conner, Slawik)	Supported	Reported out of Senate Health and Social Services Committee; action deferred 6/3/71
S.B. 459/ S.A. 1	Relating to permits for the cremation of dead bodies (cremation not to take place until state medical examiner advises that no reason exists for delay) (Hart)	Did not support in form without amendment	Passed Senate; in House Judiciary Committee
H.B. 477	Providing for a supplementary appropriation to make DAPI (Delaware Adolescent Program, Inc.) a statewide program (Weiss)	Supported	In House Appropriations Committee
H.B. 485	To provide for the regulation of and standards for ambulance service by the State Fire Prevention Commission, and to provide an appropriation therefor, and to grant immunity from suit under certain circumstances (Dillman)	Did not consider	Passed both Houses 6/22/71

A VISUAL SCREENING PROGRAM

in a Community Hospital Outpatient Department

Alvin Weiner, M.D.

Recently a new program was inaugurated by the outpatient Ophthalmology Service of the Wilmington Medical Center. The visual screening examination performed by trained ophthalmic technicians was designed for the evaluation of asymptomatic patients with no eye complaints or with visual symptoms only.

The examination consists of an external examination, visual acuity, intraocular pressure by applanation or Schiotz tonometry, visual fields utilizing the Harrington-Flock multiple pattern technique, and fundus photographs. Interpretation of the results and recommendations are made by the physician.

One or more abnormalities other than decreased near or distant acuity were found in 14 patients. These and the modality of their detection are as follows.

External Examination Abnormalities

Four abnormalities were found by external examination, one case each of pterygium, exotropia, ptosis, and non-reactive pupils. (Follow-up on the latter revealed the pupils to be extremely sluggish but probably normal; this patient should, therefore, be listed among the false positives.)

Abnormalities Found on Intraocular Pressure Examinations

Three pressure abnormalities were found. Two had borderline elevated pressures. One had asymmetric cupping of the optic nerves.

Visual Fields

Three fields were reported abnormal. Two of these were definitely false positives and the other possibly a false positive.

Photographs of the Fundi

Twelve abnormalities were found by fundus photography. These are listed below.

1. Retinal exudates, probably vascular in origin.
2. Drusen. This is abnormal but not a significant abnormality.
3. Myopic crescents. These must be considered an ophthalmoscopic abnormality but not of pathologic importance.
4. Pallor of optic discs, etiology unknown. This patient is now undergoing full evaluation.

5.-6. Asymmetric cups (two cases). These patients are definite glaucoma suspects.

7. Asymmetric cups with traumatic choroidal tear.
8. Narrow arterioles apparently not previously noted on physical examination.

9.-10. Diabetic retinopathy (two cases). The patients were both referred from the Diabetic Clinic but not specifically for diabetic retinopathy.

11. Peri-macular vascular occlusion.
12. Probable macular degeneration.

Statistical evaluation of the results reveals 14 (24%) of the 54 patients screened were found to have one or more abnormalities, not including decrease of visual acuity. Excluding the false positives, of the total number of abnormalities external examination revealed 3 (5.5%), intraocular pressures 3 (5.5%), and fundus photography 12 (22%).

Eight of the detected abnormalities were felt to require follow-up examinations, either by an ophthalmologist or by referral to another department.

Conclusions

The utilization of paramedical personnel with direct supervision by an ophthalmologist appears to offer an economically sound method of detecting significant ocular abnormalities. This program has enabled us to separate those patients who merely need refraction for glasses from those who require complete ophthalmologic evaluation. Review of the positive findings indicates the sensitivity of the screen to be high without producing an excessive number of false positives.

Dr. Weiner is a Senior in the Department of Ophthalmology, Wilmington Medical Center.

The visual screen examinations are performed by Mrs. Lois Biesinger, R.N. and Mrs. Shirley F. Cohen, ophthalmology technician.

Editorials

THE ROLE OF THE STATE SERVICE CENTER

It has been said that "necessity is the mother of invention." To state that a necessity exists for providing or improving the delivery of health care to the medically deprived is a gross understatement. As to the invention, I refer to the State Service Center. Time does not permit me to dwell upon the metamorphosis of this hybrid; however, it is a unique and interesting intermarriage.

What once was the sole domain of private medicine — namely, the delivery of health care — has gradually and of necessity been increasingly abdicated to others, eg, the hospital and governmental agencies. What is needed now is to reconstruct this fragmentation of health care into a functioning system capable of meeting the unmet demands of the medically indigent in our urban and rural populations. However, times have changed and so have the needs. The archaic concepts and methods of the past no longer suffice. Comprehensive health services of high quality are no longer a privilege; they are a right, and access must be equal to all. Poverty, ignorance, prejudice, and lack of resources can no longer bar access to health care. Racial barriers between consumers and providers must be removed, and purchasing power must be put into the hands of those who cannot afford decent care.

The State Service Center is the logical place to blend this mixture of consumer, organizations, governmental agencies, hospital and private physicians. The State, in creating this center, is at long last recognizing the needs of the community and indicating a willingness to assume its share of responsibility in indigent care; by providing, furnishing and staffing multifunctioning facilities in strategic locations, it can provide sorely needed services to its citizenry. Furthermore, the first service center has made it possible for a group of private physicians, who have long recognized the need and have demonstrated a willingness to become involved, to provide medical care, voluntarily. Although just a beginning, it is significant as the beginning of a new era in health care delivery in our community: the neighborhood health facility.

An integral part of this new concept is the need for coordination of many services into a system of health care delivery, employing education, preventive medicine, rehabilitation, etc., and utilizing the team approach which incorporates social service workers, nurses, pharmacists, paramedical personnel, health coordinators, administrators and physicians as part of the health care team.

Clearly, this type of health facility cannot function independently of the community hospital. A cooperative relationship must exist between the two. A well functioning health facility can significantly alleviate the overburdened and overutilized emergency rooms and clinics where fragmented primary care is provided. Indeed, obsolescent hospital clinics should be disbanded and primary care should be provided by the primary physician either in his office or in the neighborhood health facility. Hospital diagnostic, therapeutic and social services should be integrated with ambulatory care provided in the community.

In our community, it is hoped that some formal program for residency training in family practice can cooperatively develop between the Wilmington Medical Center and the State Service Center, thereby benefiting both. This would make available to the residency program an important contact with the community and patient source for model family practice, as well as valuable training in ambulatory care. It will benefit the health center by assuring a permanent source of medical staffing and a higher standard and quality of care.

There are many challenges ahead and many problems to be solved. However, with mutual trust and cooperation, a rewarding partnership can evolve for all, without resorting to a rigidly structured national health program.

JACK GELB, M.D.

Dr. Gelb is Medical Director of the Northeast Service Center. This address was delivered to the Delaware Public Health Association in January 1971.

TREATMENT OF HYPERLIPIDEMIAS

The plethora of current medical communications concerning the possible causation and prevention of atherosclerosis would inundate even an Evelyn Wood. A brief review of the pertinent literature can be found in this issue of the *Delaware Medical Journal.*

Although treatment of the various types of hyperlipidemias vary somewhat from pundit to pundit, the basic guidelines to be followed after proper initial diagnosis are generally agreed upon. Maintenance of ideal body weight is the single thread that joins all the different modes of therapy.

Type I hyperlipidemia is treated with a diet low in fat (approximately 15% of total caloric intake) and the use of medium chain triglycerides if desired. This particular entity responds poorly to drug therapy. The use of heparin as a lipid clearing agent in this disorder is effective only evanescently and is not useful on a long-term basis.

Type II hyperlipidemia is initially treated with dietary restriction of cholesterol coupled with a diet high in polyunsaturates. This type of diet is usually successful in lowering the plasma cholesterol 20 to 25%. Clofibrate (Atromid-S, Ayerst) may be added to the dietary regimen, and has a variable effect on cholesterol, sometimes lowering it as much as 15 to 25%. The ability of clofibrate to cause a rise in prothrombin times in patients receiving coumadin should be borne in mind when using this agent. Other drugs such as cholestyramine (thought by some to be the most useful agent in this type of hyperlipidemia), neomycin, cytellin (an aqueous emulsion of soy sterols), nicotinic acid, and dextrothyroxin have all been used with variable effect. Combination therapy may be used and is often necessary. Ileal bypass has been advocated and may lower plasma cholesterol by as much as 50%.

Type III hyperlipidemia is treated with a diet low in cholesterol and low in saturated fats. This condition is more responsive to drug therapy than Type II hyperlipidemia and can usually be treated with clofibrate alone.

Type IV hyperlipidemia is usually treated with a low calorie, low carbohydrate diet which is necessarily high in fats and proteins. It is the feeling of Lees and Wilson and others that the plasma lipids vary little if sugars are substituted for starches as the major carbohydrate source. Clofibrate may be tried in this disorder but may paradoxically raise the low density lipiproteins and plasma cholesterol. The use of nicotinic acid has been advocated for treatment of Type IV, but decreased carbohydrate tolerance and hepatic dysfunction should be looked for while this agent is being used.

Type V hyperlipidemia, which is not as rare as Dr. Wiener suggests, is treated with weight reduction and subsequently clofibrate if necessary. Progestin therapy may be tried in female patients.

The long-term efficacy of any of these regimens has yet to be proven. Still it would seem to be good medical practice to try to reduce plasma lipids and weight to normal in most patients with these disorders. This is especially true in young patients or asymtomatic family members who are picked up through screening of families of patients known to have hyperlipidemia.

William A. Taylor, M.D.

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AN OUNCE OF PREVENTION

Certain groups of our profession run a high risk of exposure to serum hepatitis. Among these are surgeons and pathologists who inadvertently either nick or stick themselves in the course of their daily work. I am sure that we all know of recent cases where such nicks or sticks have been followed by attacks of serum hepatitis of greater or lesser degree.

Now that a test is available which, in its present form, will detect between 25 and 35% of serum hepatitis carriers (the Hepatitis Associated Antigen or Australia Antigen test), I would like to offer the suggestion that, in addition to protecting our patients who receive blood transfusions, by testing prospective blood donors for H. A. A., we should consider a little preventive medicine for ourselves. This could be accomplished by testing each surgical patient preoperatively and each patient for autopsy prior to or during the procedure. Should a positive test be obtained, this would serve as a warning to the operator (and his assistants, if any) to exercise especial care to avoid nicks and sticks. In the unfortunate event that despite all due care, a nick or a stick occurred, the victim could, with all due dispatch, receive an injection of gamma globulin, which hopefully would protect his liver parenchyma from serious damage. *J.W.A.*

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BOOK REVIEW: AMA DRUG EVALUATIONS

Harry F. Dowling, M.D.

The busy doctor has all he can do to take care of his patients and has little time to spare to keep up with new information. In the time he has, information must be brought to him in a form that is authoritative, up-to-date, readily comprehended and stripped of excess verbiage and speculation. Getting the facts on new drugs and comparing them with the established drugs are bewildering to the practicing physician, complicated by such diverse factors as the deluge of new drugs (averaging 185 per year, not including new dosage forms, for the ten years beginning in 1959[1]), aggressive promotion, the long time required for accurate scientific information to filter down from the laboratory to practice, and the publicity attending the activities of certain Congressional committees.

With these problems in mind, the Council on Drugs of the American Medical Association began in 1968 to fashion a new book[2] which would give the physician information on all of the important drugs and mixtures used in the practice of medicine, as authoritative, up-to-date and as free from bias as it could possibly be made. This book, entitled *AMA Drug Evaluations*, has just been published.[3]

The main section of 675 letter-sized pages is divided into 90 chapters, each on a particular class of drugs. The aim of the Council has been to list every drug or mixture that is distributed nationally and dispensed exclusively or mainly by prescription, to describe the actions, adverse effects, method of administration and doses of these preparations, and to recommend which ones should be used. The Council has stated its opinions frankly. When it could not recommend a drug, it said so. We have long needed this kind of frankness. Comparisons have been made among drugs of the same class. Of particular value to the practicing physician is the selection of a drug of choice when this is feasible. The Council has performed a Herculean task exceedingly well. They provide clear, sane and reasonable guidelines for the practicing physician, at the same time allowing him plenty of leeway for the exercise of his individual judgment.

The question may be asked by some, "Who are these experts? Why should they set themselves up as judges?" The answer is that the Council and the Staff of the Department of Drugs, in addition to the fact that they are themselves knowledgeable in the field of drugs, have called upon a large number of practicing physicians and pharmacologists as consultants, and have incorporated their opinions into the final conclusions. Although some persons will differ with an occasional recommendation, it is safe to say that no other group has attempted anything as comprehensive, and no other book exists which can promote the practice of rational therapy as this one can.

The introductory section of 27 pages should be read by every physician. When he wishes to look up a particular drug, he can either turn to it directly or consult the comprehensive index of therapeutic indications in the back of the book. He should then read the first paragraphs of the chapter in which the drug is listed before referring to the statements on the particular drug. In this way he

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will obtain a comparative view of the group of drugs from which he wishes to prescribe.

Another meritorious feature is a section on adverse reactions in the back of the book. Under each adverse reaction the doctor will find a list of drugs that have been associated with such a reaction.

It is inevitable that in a first edition of a book as ambitious as this one, some mistakes will occur and some things will have been omitted that would have added important information or made matters clearer. I found relatively few of these in a brief reading of several chapters. Where the physician disagrees with an opinion, detects a mistake or wishes to suggest that additional material be included, he should write to the AMA Council on Drugs so that his opinions and ideas can be incorporated into the next edition, which the staff is beginning to work on already.

All in all, the practicing physician will find this an ever-helpful companion which he will want to keep in a convenient and accessible place for ready reference. Because it is too large for him to carry with him at all times, I hope that hospitals will find it possible to provide copies on each ward and in every outpatient clinic.

REFERENCES

1. Dowling HF: Medicines for Man. The Development, Regulation, and Use of Prescription Drugs. New York, Alfred A. Knopf, 1970.
2. Council on Drugs, American Medical Association: AMA drug evaluations, a new book on drugs. JAMA 204:702-710, 1968.
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Letters to the Editor

To the Editor:

I am writing in response to a recent article authored by Dr. William Duncan titled "Concern." (Del Med Journ, April '71) To allow this indictment of the Wilmington area physicians and the Wilmington Medical Center to go unanswered would mean either that as physicians we totally agree or that indeed we are "indifferent" as accused.

By means of a letter allegedly received by Dr. Duncan from an unidentified "respected minority professional," we are pictured as being "selfish and negative" in attitude, "prejudiced," "haphazard" in the way we practice medicine, "hurried and disrespectful," "superior acting" in our attitudes, and "arrogant and unconcerned." About the only descriptive adjective left out was that we are completely inhuman.

Personally, I am tired of continually seeing our profession chastised because of problems that are social, economic, and environmental in nature and that are beyond the control of the medical profession.

Dr. Duncan's correspondent fails to recognize or to admit to the hundreds of local physicians who have contributed literally hundreds of thousands of hours to the staffing of these clinics long before it became a vogue for other members of our society even to recognize that there was a problem; he fails to recognize that as human beings, physicians have their own frustrations; he fails to recognize that doctors are frequently late by unavoidable necessity even in treating their private patients; he fails to recognize that we are "hurried," not by design, but because of the total demand made upon us, and that many of us have a work load greater than seventy hours per week; he fails to recognize that as humans we could be abrupt because we have our own personal problems, may have had little sleep, or may share some of our patients' problems that many times are insolvable; he fails to recognize that the physician may be given a patient, previously unseen, whose chart is two inches thick and would require five hours to digest, when only fifteen minutes has been set aside for a visit; he fails to recognize his own prejudices; he fails to recognize that patients as well as physicians must have eleemosynary attitudes; and finally he fails to recognize that the average doctor is not arrogant, but humble, and that for him to carry the load and to respond to Society's expectations he must indeed be a "superior" individual.

I. J. Tikellis, M.D.

Delaware Academy of General Practice

THE COMMISSIONER OF FOOD AND DRUGS REPLIES

In the May issue of the *Delaware Medical Journal* we published under the title "Medicine by Decree" a letter written by Mac F. Cahal, Executive Director of the American Academy of General Practice, criticizing recent directives of the Food and Drug Administration relating to fixed drug combinations. Following are excerpts from a letter by Charles C. Edwards, M.D., Commissioner of Food and Drugs.

"For a variety of reasons, there has been widespread misunderstanding about the FDA policy on combination drugs. To correct this and to be helpful, we want to explain our combination drug policy to you.

"As we review the several hundred letters that have come to us objecting to the proposed policy, a number of themes emerge.

"The first is that drug combinations should not be banned by an across-the-board policy statement. We agree.

"Second is the assertion that many drug combinations are safe and affective for their intended uses, while others are not. We agree with this, too.

"Third, the point is made that the practicing physician has not been consulted adequately; that the practicing physician is the one who knows best about drug effectiveness from his daily observations with his patients; and that the policy proposed is a product of "ivory tower" thinking of bureaucrats or academicians out of touch with the realities of patient care. Actually, we did consult with many knowledgeable practicing physicians before proposing this policy . . . .

"The next major objection is that the policy we propose will greatly increase patient cost and will confound both prescribers and pharmacists in prescribing and in compounding drug mixtures. The last is said to introduce problems of quality control, drug compatibility, and patient acceptance of needed medicines. None of these is a reality. If a drug combination is medically justified, there is no reason why it should not continue to be available from the pharmaceutical manufacturers. If it cannot meet reasonable standards as to safety and effectiveness, there is no patient convenience and economy in taking an irrational or even harmful drug mixture.

"As we have indicated, we are not against fixed dose combinations. There is now and always will be a place for good combination drugs.

"Our policy on drug combinations is remarkably simple to state and to defend. The fundamentals are: that more than one drug should not be used when one is all that is needed; that drugs in fixed combination should satisfy the needs of a population of patients who require concomitant treatment by the two or more drugs in the combination; that the dose of such components be appropriate for the intended patients. In addition, a combination is appropriate when the added ingredient enhances the effectiveness of the main active ingredient and when an added ingredient minimizes the potential for abuse of the main active ingredient. . . .

"We recognize the need for us to put before the profession what is actually being proposed so that the physician can speak to it rather than to something that has not been proposed."

* * *

If the appropriate sanitation services are not provided, the counterpart of increasing opulence will be deepening filth.

John Galbraith

President's Page

A SUBSTITUTE FOR THE COMMUNITY PHYSICIAN

That the community physician no longer exists was the closure of last month's president's message.

Yet physicians ever since Aesculapius have pictured themselves as deliverers of total medical care. Indeed, many medical men of science have advanced the frontiers of medicine totally unaware that they were dragging on their coattails many non-physicians who saw opportunity to generate their own advantage by an alliance with medicine. Some of these hanger-onners have been to the general good and some not, but all have been aided to their ends by the efforts of the men of medicine.

In recent years the advantage seekers have included the men of HEW, Blue Shield, other health care systems, and such groups as social workers, chiropractors, physiotherapists, optometrists, and, most recently, physician assistants. Regardless of the value of these groups just mentioned, we have allowed the picture of the total physician to be subdivided; it would almost at this time appear that we have given up the world of the total or community physician to them.

But in Delaware it is not so. We are continually alerting all of our membership to our interest in and our movement toward reestablishing the community or total physician concept through our proposal of a Medical Foundation. This Foundation will permit physicians to group together, work together, treat and meet each citizen's health needs together, thus bringing us full cycle back to the availability of total care for each community's citizens through one organized body.

In its embryonic state, the Medical Foundation cannot quite be the total physician, but it is important that we physicians prepare ourselves and our patients for the values to be reaped by the Delaware Medical Foundation of the future, a Medical Society of Delaware function.

Rhodyn J Bishoff

In Brief

Speakers on "Ask the Doctor"

Speakers for August 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: August 3, Milan Q. Felt, M.D., *Summertime Accidents;* August 10, Richard F. Brams, M.D., *Hay Fever*; August 17, Robert L. Meckelnburg, M.D., *Diagnostic Use of Radioisotopes in Medicine*; August 24, Charles F. Richards, M.D., *Colostomy*; August 31, Mark G. Cohen, M.D., *Diet, Exercise, and Risk Factors in Heart Disease.*

In the News

At the annual meeting of the Delaware Division of the American Cancer Society, Leslie W. Whitney, M.D., past president and professional delegate to the national board from 1963-1970, was among those honored. Dr. Whitney was given the annual National Division Award. John J. Egan, M.D. was elected division president to succeed Herbert M. Baganz, M.D.

Bernadine Z. Paulshock, M.D. was recently granted Fellowship in the American College of Physicians.

At the recent annual meeting of the Delaware Heart Association Mark G. Cohen, M.D. was elected president and E. Wayne Martz, M.D. was elected senior vice president.

Preventive Medicine Defined

The Board of Regents of the American College of Preventive Medicine recently adopted an official definition of the term "Preventive Medicine." "*Preventive Medicine* is that branch of medicine which has primary interest in preventing physical, mental, and emotional disease and injury in contrast to treating the sick and injured. Secondarily, it is concerned with slowing the progress of disease and conserving maximal function."

Drug Study Published

"Marijuana: a selective bibliography"— annotated list of selected scientific papers published on the subject from 1924 to 1970 — has been published by the Brain Information Service of the University of California at Los Angeles. The bibliography can be obtained by writing to Brain Research Institute Publications Office, UCLA Center for Health Sciences, Los Angeles, Calif., 90024. Checks for $3.00 may be made to the Regents of the University of California.

New Group Formed

Under advisement of Pierre L. LeRoy, M.D. of Wilmington, a *Spina Bifida Association* has been formed in Delaware. Along with the goals of research in genetics, eugenics and the evaluation of growth and development of the spina bifida person, the group hopes to be able to communicate with new parents at the earliest time possible. Anyone interested in more information concerning this group can obtain full details by writing to SBA of Delaware, PO Box 266, New Castle, Del., 19720, or by calling 655-1382 or 478-5869.

"Insurance" Health Care

Among the many health care programs being proposed for the US is *Healthcare*, the plan proposed by the Health Insurance Association of America, a comprehensive plan which would make maximum use of private health insurance agencies in the implementation of the total schema.

An explanation of the details of Healthcare is available from the Health Insurance Council, 750 Third Ave., New York, N.Y., 10017, or from the Medical Society of Delaware office.

Drug Warning Issued

A potentially harmful mixture of cocaine and boric acid has been found in the illicit drug market in at least three cities. Bureau of Narcotics and Dangerous Drugs chemists have analyzed samples of the mixture obtained in New York and Chicago. US Customs service has also encountered samples of the mixture in San Antonio. The boric acid content runs as high as 50 percent. Based on use of cocaine by abusers this may result in an intake of up to 150 mgs of boric acid a day. (*AAGP Headquarters Bulletin.*)

Basic Research Award

In the first major effort to foster research leading to a cure of paraplegia, the National Paraplegia Foundation has announced a $10,000 award to be granted in the spring of 1972 to the scientist of the world making the greatest contribution toward this end. The establishment of the award stems from technological advances revealing that human spinal cord regeneration, formerly considered hopeless, may now be achieved through basic research. Questions regarding the conduct of the award program may be addressed to the National Paraplegia Foundation, 333 N. Michigan Avenue, Chicago, Ill., 60601.

Radiology Syllabus

The American College of Radiology has prepared home-study tests and syllabus sets for its members and other physicians which will provide them with a means of assessing the current level of their knowledge and guidance for doing follow-up study in various areas of diagnostic radiology. The first test sets, dealing with the chest, will be mailed to enrollees in the fall of this year. The cost to enroll is $45 to American College of Radiology members, $35 to residents, and $65 to nonmembers. (Checks should be sent to the American College of Radiology, 20 N. Wacker Drive, Chicago, Ill., 60606. The study kits will be mailed from the College's Washington office, 6900 Wisconsin Avenue, Chevy Chase, Md., 20015.) Scores on the programs will be kept in the strictest confidence, and only the doctor will know his score in order to help him plan his continuing education.

182nd Annual Meeting

Committee Reports

Deadline for filing Committee and Liaison reports for the Annual Meeting is August 28. Please send your reports in as soon as possible. Time must be allowed to reproduce the reports for preliminary consideration by the Board of Trustees of the Medical Society of Delaware on September 9.

Resolutions

Resolutions for presentation to the House of Delegates should be sent to the Society office by August 27. Any member may present a resolution.

Dover Drug Abuse Notice

DRUG INFORMATION ACTION LINE, Kent County — *For* Help call 678-2000, *To* Help call 736-6505.

CLINICAL NOTICES AND MEETINGS

Occupational Health Congress

The 31st Annual AMA Congress on Occupational Health will be held at Jackson Lake Lodge in Grand Teton National Park, Wyoming, August 29-30, 1971.

Emergency Care Courses

The Committee on Injuries of the American Academy of Orthopaedic Surgeons will present the following courses for ambulance, civil defense, industrial safety, and public health personnel; emergency medical technicians, emergency squads, volunteer rescue squads, safety engineers, and nurses: Washington, D. C., August 25-28, and New York, N. Y., October 14-16. Tuition is $50, which includes luncheons, course materials, and the text reference. All courses are designed to present the latest practical concepts and techniques. All registrants are expected to have had advanced first aid training. For further information, contact American Academy of Orthopaedic Surgeons, 430 North Michigan Avenue, Chicago, 60611.

ACCP Postgraduate Program

The American College of Chest Physicians has 18 postgraduate programs scheduled for 1971-1972. A calendar is available from them at 112 East Chestnut Street, Chicago, Ill., 60611.

Second Diving Medicine Course

The second Diving Medicine course for physicians will be held August 21-28, 1971 in San Diego, Cal. The first course of this type (see DMJ, April '71 issue, *In Brief,* for details) held in the Bahamas, was completely filled 50 days beforehand. Interested physicians are encouraged to act promptly. For information write: The National Association of Underwater Instructors, 22809 Barton Road, Colton, Cal., 92324.

Postgraduate Program

The Division of Maternal and Child Health of the University of California School of Public Health announces postgraduate programs leading to the degree of Master of Public Health for pediatricians, obstetricians, and other physicians. Fellowship support is available, including basic support for the trainee, an allowance for dependents, tuition and fees. Applications are now being accepted for the group entering September 1971. For information, write to Helen M. Wallace, M.D., School of Public Health, University of California, Berkeley, California, 94720.

Cardiology for Nurses

The American Heart Association Council on Cardiovascular Nursing will present *3 Days of Cardiology for Nurses, No. 13,* in Philadelphia during September. Write to: Katherine A. Lembright, R.N., American Heart Association, 44 East 23rd Street, New York, N.Y., 10010.

ACP Course

The American College of Physicians and Royal College of Physicians and Surgeons of Canada will present *Organ Failure — Lung, Heart, Kidney, Blood, Liver,* September 6-10, 1971 at Dalhousie University Faculty of Medicine, Halifax, Nova Scotia. Write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

SURGEON: Board-certified. Interested in general and/or thoracic surgery. Presently located in Canada.

RADIOLOGIST: Completing residency by August 1972. Interested in urban or rural areas (within an hour's drive of the city).

RADIOLOGIST: Will complete U. of Michigan residency summer 1972. Interested Delaware placement.

SURGEON: Board-eligible U. of Pennsylvania graduate. Completing fellowship at U. of Maryland Hospital. Available August 1.

THE FORUM

Environment And Health

WILMINGTON RAT CONTROL PROGRAM

Mrs. Louella Metzger

On Monday night, June 15, 1970, a Town Hall Meeting was held in Jimmy Jenkins' Branch of the Kingswood Community Center. As a result of this meeting, the Department of Health and Social Services was asked to investigate the residents' complaints about rats. It became evident that a serious health hazard existed, and the Division of Physical Health was given the responsibility of developing a rat control program in cooperation with the City of Wilmington. On October 1, 1971, the Wilmington Rat Control Program was formally launched.

The program is a four-fold one encompassing surveys of all premises in known and reported rodent areas of the city, baiting for eradication where necessary, attention to environmental sanitation, and education.

The city is divided into tracts. Each premise in a tract is surveyed by trained environmental health aides for active rat signs, rat food, rat harborage, and poor environmental sanitation.

The baiting program is done in two stages. A "quick kill" baiting is done at those premises which have the heaviest infestation. This is then followed with the use of "rat restaurants," a poison bait feeding station, containing an anticoagulant bait. Large bait blocks impervious to weather are used in sewers. Residents of the city who have a rodent problem need only call the "Rat Line," 658-1200, to have a survey of their premises made and a baiting program started.

Environmental sanitation is the key to a successful rodent control and eradication program. In a pilot project the use of plastic garbage can liners was so successful in improving sanitation, the bags are now distributed to residents in several areas on a regular basis through the Northeast State Service Center, Kingswood Community Center, and Southbridge Medical Activities Center. Abandoned and dilapidated buildings are a contributing factor to the presence of rodents. The Wilmington Department of Licensing and Inspections is most cooperative in abating these complaints.

The educational phase of the program includes flyers, an elementary school program, and an adult education program. Flyers, written in English and Spanish, have been widely distributed. A guide for teachers, student work books, and films are used for both the elementary and adult education classes in the city schools.

Rats can be controlled, but if the best principles of environmental sanitation are not constantly practiced, the rodent problem remains a major health hazard.

Ten months after its inception, the Division of Physical Health feels justified in considering the Rat Program a valuable addition to its roster of successful Preventive Health programs.

Mrs. Metzger is a health educator for the City-County Health Office, Wilmington.

This page is sponsored by the Delaware Tuberculosis and Health Society.

Professional Clinical Laboratories, Inc., of Wilmington, Delaware is a federally approved, full-service reference laboratory.

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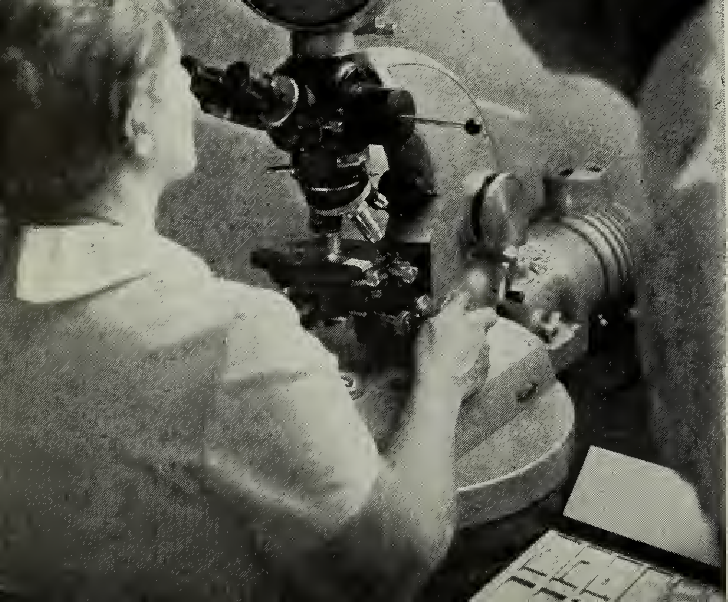

Delaware Medical Journal

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ARRHYTHMIAS IN MYOCARDIAL INFARCTION

• The early detection and aggressive therapy of arrhythmias in acute myocardial infarction have very significantly reduced the mortality of hospitalized patients with this highly fatal disease.

Roman W. DeSanctis, M.D.

During the past eight years, the development of the Coronary Care Unit (CCU) and an appreciation of the concepts of coronary care have dramatically reduced the mortality in acute myocardial infarction, particularly by preventing sudden unexpected arrhythmic death.[1] The CCU was originally conceived as an area that would make for more successful resuscitation for those patients who suffered unexpected cardiac arrest by virtue of having specially trained personnel and equipment immediately available. However, further careful monitoring of patients with myocardial infarction has demonstrated that many sudden fatal arrhythmias developing in patients with myiocardial infarction are often preceded by the appearance of premonitory arrhythmias of considerably lesser consequence.[2] Hence, the CCU has taken on increasingly a prophylactic role, with the additional objective of detecting these premonitory arrhythmias at the earliest moment and suppressing them appropriately before they can develop into more serious rhythm disturbances.

Before the development of cardiac monitors, the incidence of arrhythmias in patients with myocardial infarction was thought to be about 35%. However, with the increasingly widespread use of monitoring devices, several series have now reported an incidence of between 73 and 94%.[3,4]

Editorial comments appear on page 225

Most arrhythmias, especially the serious ones, occur within the early days of myocardial infarction. For example, it has been estimated that ventricular fibrillation is 25 times more likely to occur in the first four hours after myocardial infarction than in the next twenty-four hours. This underscores the necessity of applying the principles of coronary care to patients with myocardial infarction at the earliest possible moment. Since 90% of all serious arrhythmias occur within the first five days after myocardial infarction, it is generally thought that patients with acute myocardial infarction should be kept in the CCU

Dr. DeSanctis is Associate Clinical Professor of Medicine, Harvard Medical School and Physician, Massachusetts General Hospital.

Much of the material contained in this manuscript was presented at a lecture at the Wilmington Medical Center, January 27, 1970.

for five days. Our own policy is to keep patients with uncomplicated myocardial infarction in the CCU for five days. Patients admitted with coronary insufficiency who do not develop myocardial infarction and who are free of arrhythmias are discharged from the CCU after three days. However, any patient with a life-threatening arrhythmia is kept for a full five days after the arrhythmia has been controlled.

In general it can be said that both the absolute incidence of arrhythmias and the incidence of life threatening arrhythmias are directly proportional to the severity of the damage to the myocardium caused by the infarct. Thus patients with severe congestive heart failure or cardiogenic shock as a consequence of myocardial infarction are considerably more likely to develop fatal arrhythmias than patients without these serious complications.

Causes of Arrhythmias in Acute Myocardial Infarction

A great deal of attention has been paid to the therapy of arrhythmias in acute myocardial infarctions, but perhaps not enough attention has been given to those factors which are responsible for the arrhythmias. I think of the causes of arrhythmias in five categories: (1) anatomic, (2) metabolic, (3) hemodynamic, (4) autonomic and (5) iatrogenic. Each of these will be discussed briefly.

Anatomic Causes. James has carefully and brilliantly elucidated the nature of the coronary circulation in relationship to arrhythmias in myocardial infarction.[5] Coronary occlusion may compromise the blood supply to those structures which are responsible for the generation and propagation of the cardiac impulse. Two arteries are particularly important in this context: the artery to the sinus node and the artery to the A-V node.

The artery to the sinus node arises from the right coronary artery in 55% of humans and from the left circumflex coronary artery 45% of the time. Occlusion of this vessel accompanying myocardial infarction can result in ischemia, if not actual infarction of the sinus node. This may result in instability of sinus rhythm, causing either bradycardia or tachycardia, as well as atrial instability. The instability of the atrium is further aggravated by the fact that the sinus node artery provides the major arterial supply to the atrial musculature. Should atrial infarction occur as a consequence of occlusion of this vessel, this may also contribute to instability of the atrium, leading to supraventricular arrhythmias.

The artery to the A-V node arises from the right coronary artery 90% of the time and from the left circumflex coronary artery only 10% of the time. Right coronary artery occlusion is generally associated with inferior or diaphragmatic myocardial infarction, and hence heart block is much more common with infarcts in this distribution than with anterior wall infarction.

Another aspect of coronary flow relative to the nerve supply of the heart has also been elucidated by James. It is well known that vagal phenomena (bradycardia, nausea, sweating, tracheal burning, hypotension, etc.) are much more common with inferior than with anterior infarction. He has demonstrated that the floor of the right atrium between the coronary sinus and the A-V node is rich in cholinergic fibers so that ischemia in this area is likely to result in a vagal discharge.

Ventricular arrhythmias bear no relationship to the site of myocardial infarction. One additional anatomic factor suggested by James in the genesis of arrhythmias is that of pericarditis. Pericarditis is seen frequently in myocardial infarction and may irritate the surface of the heart. In particular, the sinus node is very superficial and thus is vulnerable to irritation. James postulates that pericarditis may be a reason for atrial arrhythmias when they occur with anterior wall infarction.

Metabolic Causes. Clearly, this is the area of greatest importance in the genesis of arrhythmias in myocardial infarction, and it is also the area about which least is known. It has been shown experimentally that ventricular arrhythmias frequently arise at the zone of myocardium between the infarcted and noninfarcted heart. This gave rise to the concept of the "oxygen gradient," which alleged that the difference in tissue oxygen potentials between infarcted and noninfarcted heart led to membrane instability and arrhythmias. A number of experimental studies have subsequently shown this to be erroneous, and it is unlikely that an oxygen gradient plays any significant role in causing arrhythmias. A number of unquestionably important changes occur within an area of infarcted heart muscle. Infarction leads to disruption of cells, with the release of large amounts of potassium, enzymes, amino acids, adenosine, possibly kinins, and perhaps still other substances that may be important in causing arrhythmias. Recently there has been interest in the possibility that fatty acids mobilized from adipose stores might lead to membrane instability and arrhythmias.[6] This remains speculative at the present time.

Hemodynamic Causes. As indicated previously, patients who have severe compromise of left ventricular function as a consequence of myocardial infarction are more prone to the development of all types of arrhythmias, but especially life-threatening arrhythmias. Lown in particular believes that most atrial arrhythmias in myocardial infarction are the result of left ventricular failure, which in turn gives rise to acute left atrial hypertension and distention, and consequent arrhythmias.[7] Although this is unquestionably true in some cases, we have seen a number of instances of supraventricular arrhythmias arising without any evidence of congestive failure of cardiogenic shock.

Autonomic Causes. Parasympathetic activity clearly contributes to bradycardia in patients with myocardial infarction. Ischemia of parasympathetic nerve fibers, as mentioned above, is one factor. However, just severe pain itself may cause excessive vagal tone, and medications, particularly morphine, may add to this.

There is also a question of the importance of excessive sympathetic activity in patients with myocardial infarction. It has beeen shown by a number of investigators that catecholamine excretion is often elevated in patients with myocardial infarction.[8] In general, the sicker the patient, the higher the level. This, however, may merely reflect a compensatory mechanism for pump compromise. Nevertheless, some investigators have shown arrhythmias to be associated with high catecholamine excretion levels in the absence of heart failure.[9] This is an area which requires further investigation. However, I do believe it emphasizes the need to keep patients with myocardial infarction in an atmosphere that is as tranquil and relieved of tension and anxiety as possible.

Iatrogenic Causes. Administration of certain drugs may lead to arrhythmias. This includes the digitalis glycosides, antiarrhythmic agents, morphine, etc.

Arrhythmias in Myocardial Infarction

Arrhythmias consequent to myocardial infarction can be classified in several ways, but I shall choose to describe them as either active or passive. Active arrhythmias are those which are due to an enhanced excitability and automaticity of the heart as a result of infarction. Passive arrhythmias occur as a consequence of a depression of the structures within the heart which originate and propagate the cardiac impulse.

Active Arrhythmias. Active arrhythmias may be further classified into ventricular and atrial. Active ventricular arrhythmias include ventricular fibrillation, ventricular tachycardia, and ventricular premature beats (V.P.B.'s). Active supraventricular arrhythmias include sinus tachycardia, atrial and nodal (junctional) premature beats, atrial and nodal tachycardia, atrial flutter, and atrial fibrillation.

Ventricular fibrillation is fatal unless immediately treated by external shock. It may occur either primarily in otherwise uncomplicated myocardial infarction, or secondary to advanced pump failure. Resuscitation is very effective if properly instituted in the former, but the results of resuscitation in secondary ventricular fibrillation are very poor.

Ventricular tachycardia occurs in 8% of patients in our CCU. It is defined as three or more consecutive ventricular beats at a rate of greater than 120 per minute. Ventricular tachycardia often results in severe hemo-

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dynamic deterioration and must be treated and suppressed vigorously.

Ventricular premature beats occur in 90% of patients with acute myocardial infarction, and have been recognized as the most important rhythm to detect in the CCU setting. V.P.B.'s are frequent in the early hours of infarction and frequently precede the development of ventricular tachycardia or ventricular fibrillation if they are untreated. It has been recognized for some time that ventricular premature beats that fall in the so-called "vulnerable phase" of the cardiac cycle are much more likely to precipitate ventricular tachycardia or ventricular fibrillation than those which occur outside this zone. The vulnerable phase is usually localized to the ascending limb and apex of the T wave of the electrocardiogram, but in the ischemic heart it is very likely that it covers a much wider zone. Ventricular tachycardia and fibrillation are usually preceded by V.P.B.'s. This is not as true early in the course of myocardial infarction as it is later. The general guidelines for the suppression of ventricular premature beats are as follows: (1) when they occur with an absolute frequency of greater than five per minute; (2) when they are multifocal; (3) when they fall in the vulnerable zone; and (4) when they occur in salvos of two or three beats.

The treatment of choice of V.P.B.'s and ventricular tachycardia in the setting of the coronary care unit is intravenous lidocaine. This can be given initially as an intravenous bolus of 1 mg/kg of body weight. This dose can be repeated every five minutes until either a total of 4 mg/kg has been given, or toxic side reactions occur. Toxic effects of lidocaine include central nervous system stimulation or depression, especially seizures. For prolonged suppression of V.P.B.'s lidocaine should be given as a continuous intravenous drip in doses of approximately 1 to 4 mg per minute.

If, as lidocaine is reduced in dosage, ventricular premature beats recur, then a longer acting agent must be started. We prefer procainamide or quinidine. Procainamide is given as a loading dose of 750 mg orally or intramuscularly, followed by 250 to 375 mg every three to four hours. Quinidine is given in doses of 200 to 300 mg every six hours. We have not found diphenylhydantoin to be of much value in the suppression of ventricular premature beats except those that are caused by digitalis toxicity. It is very important that quinidine and procainamide not be used in patients who have advanced congestive heart failure, hypotension, or second or third degree heart block, as all of these problems may be aggravated by these drugs.

Experience in Procainamide Administration

We have recently published an article dealing with our experience in the prophylactic administration of procainamide in a double blind fashion to patients with acute myocardial infarction.[10] We have shown that the drug can be effective in preventing active ventricular arrhythmias. However, in most coronary care units the patients are under close observation, and such therapy is probably unnecessary. It may have a role in units where the monitoring may be less intense.

We usually give lidocaine by rapid intravenous bolus as described above in the treatment of ventricular tachycardia. However, this arrhythmia sometimes results in such sudden and severe decompensation of cardiac function that emergency electrical conversion is necessary. Cardioversion is very successful in terminating ventricular tachycardia.

Although sinus tachycardia is sometimes considered a supraventricular arrhythmia, this is really inaccurate. Sinus tachycardia is almost invariably secondary to something else that is transpiring rather than a primary arrhythmia itself. Sinus tachycardia is almost always present in patients with congestive heart failure or cardiogenic shock unless heart block is also present. Fever, anxiety, pericarditis, and medications can all contribute to sinus tachycardia. Therapy of sinus tachycardia is directed at the underlying cause rather than at the rhythm *per se*.

Atrial and nodal premature beats are frequent in patients with acute myocardial infarction and are usually of no consequence except that they may be harbingers of more sustained supraventricular arrhythmias.

Atrial and nodal (junctional) tachycardias are extremely unusual in myocardial infarction. They usually are associated with diaphragmatic infarction, but may be complications of "pump failure," as previously pointed out. The usual therapeutic maneuvers of carotid sinus massage, induced gagging, the Valsalva maneuver, etc. will usually suffice to stop the attack. Alternately, digitalis glycosides or vasopressors may be used, and, rarely, even cardioversion is necessary.

Atrial flutter occurs in about 5% of patients with acute myocardial infarction. It may be a rather stubborn rhythm, and the ventricular rate may be difficult to control with digitalis. Although the rhythm responds well to electrical conversion, I am somewhat conservative about cardioversion in atrial flutter because of the tendency for this rhythm to recur. My practice is to give about one-half of the usual intravenous digitalizing dose (.25 mg ouabain, or .5 mg of digoxin). If this does not convert the arrhythmia within an hour, cardioversion is usually performed, using a synchronized direct current shock and diazepam (Valium, Roche) anesthesia. Because of the tendency to recurrence I usually start patients with atrial flutter on quinidine 200-300 mg every six hours.

Atrial fibrillation complicates about 10% of cases of acute myocardial infarction. Usually, the ventricular rate can be adequately controlled using digitalis glycosides, but occasionally the arrhythmia may result in such severe hemodynamic deterioration that urgent cardioversion is necessary. After conversion of atrial fibrillation, patients are also generally placed on quinidine.

Although both atrial flutter and atrial fibrillation tend to recur in the early days of infarction, the rhythms will almost always disappear spontaneously in several days.

Passive Arrhythmias. Passive arrhythmias are characterized by bradycardia. A slow heart rate has many adverse effects in acute myocardial infarction. Bradycardia results in a fall in cardiac output. Furthermore, bradycardia may contribute to the development of ventricular arrhythmias. Passive arrhythmias include sinus bradycardia, sinus arrest, heart block, and accelerated idioventricular rhythm.

Sinus bradycardia is frequent early in the course of myocardial infarction, particularly in association with inferior wall infarction. A sinus rate of under 60 is generally considered undesirable, although this must be taken in relation to the patient's normal heart rate. Some patients normally run a slow heart rate, and in such cases bradycardia is not as ominous as it is in others. Usually, vagal factors contribute significantly to the bradycardia and can be overcome by atropine. This is usually given in a dose of .5 to .75 mg intravenously and can be repeated every three to four hours as necessary. However, atropine may contribute to urinary retention in males, and, if used in high enough doses, may precipitate a very undesirable psychosis, especially in the elderly. I rarely give more than 2.5 mg total atropine in a twenty-four hour period of time. Alternatively, the heart rate can be accelerated by the use of beta-adrenergic drugs, such as isoproterenol or epinephrine. One disadvantage of these drugs in myocardial infarction is that they greatly increase myocardial oxygen consumption by increasing cardiac contractility. The heart rate can also be accelerated by atrial pacing, which can frequently be accomplished easily by the passage of an electrode transvenously at the bedside.

Sinus arrest is one further stage down the line from sinus bradycardia. The combination of ischemia to the sinus node together with the other factors contributing to passive arrhythmias may actually inactivate the sinus. Such cases may be associated with a nodal or ventricular escape mechanism, but in the early setting of acute myocardial infarction this can lead rapidly to progressive slowing and even cardiac arrest. When cardiac standstill occurs in this setting, it is totally treatable by pacing either externally or internally. When cardiac arrest occurs as the end stage of pump failure with hypoxia and acidosis, resuscitation is usually not successful.

Heart block complicates approximately 10% of cases of acute myocardial infarction. The difference between heart block compli-

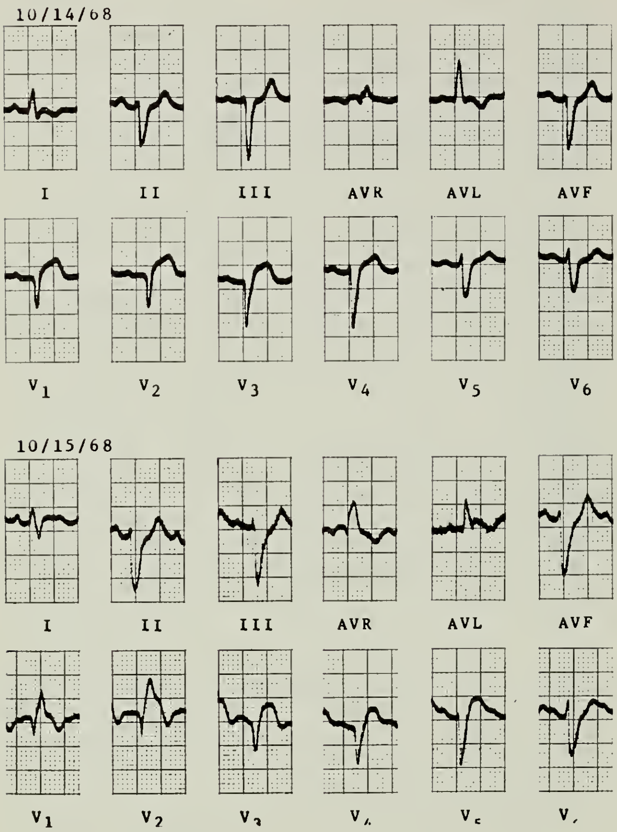

Figure 1 — Electrocardiograms showing the development of right bundle branch block in a patient with an acute anterior wall infarct. The upper tracing (10/14/68) shows the anterior wall infarct. The left axis deviation is consistent with block of the anterior division of the left bundle. Lower tracing (10/15/68) shows the appearance of right bundle branch block. Shortly after this, the patient suddenly developed complete heart block and expired.

cating anterior and posterior infarction should be clearly understood, as the significance is very different.

Heart block accompanying diaphragmatic infarction is a consequence of ischemia to the A-V node and is rarely caused by infarction of this area. Hence, it is usually transient, often associated with a relatively small infarct, and generally well tolerated. The progression is frequently through second degree block of the Wenkebach type, and the escape focus is usually in the area of the A-V node or junction, which means that the heart rate is frequently between 45 and 55 beats per minute. In contrast, patients with heart block complicating anterior myocardial infarction usually have a massive infarct, and the pathology frequently involves actual infarction of the bundle branches themselves. Hence, such patients usually have evidence of severe compromise of cardiac function as indicated by congestive failure and cardiogenic shock. Heart block, when it occurs, is frequently precipitous in onset and without any warning, as opposed to the Wenkebach phenomenon in diaphragmatic infarction. Recently, attention has been focused on the ominous significance of the development of either right or left bundle branch block with anterior wall infarction. (Figure 1) This is usually associated with a very large infarct and frequently leads to complete heart block. The mortality is approximately 80% in these cases.

It is generally thought that ventricular pacing is not necessary in patients with heart block accompanying diaphragmatic infarction unless (1) the heart rate cannot be maintained above 45 beats per minute; (2) there is complicating hypotension or congestive heart failure; or (3) the slow heart rate leads to significant ventricular irritability. In contrast, all patients with heart block accompanying anterior wall infarction should be paced. In addition, in our CCU, any patient who develops right bundle branch block with right or left axis deviation or left bundle branch block as a consequence of anterior wall infarction has a standby pacemaker in place. Whenever a pacemaker is used in myocardial infarction, it should be of the demand or standby type in order to avoid competitive pacing should the A-V block recede or ventricular irritability occur.

Accelerated idioventricular rhythm could be classified as either an active or a passive arrhythmia. It was originally interpreted as a form of slow ventricular tachycardia. This rhythm occurs when there is a combination of a basically slow sinus rate and a somewhat accelerated focus from either the A-V node or ventricles. Acceleration is presumably the result of the irritative effects of the myocardial infarction. It is likely to be manifest when sinus bradycardia is present. Rothfeld has nicely characterized this arrhythmia.[11] It

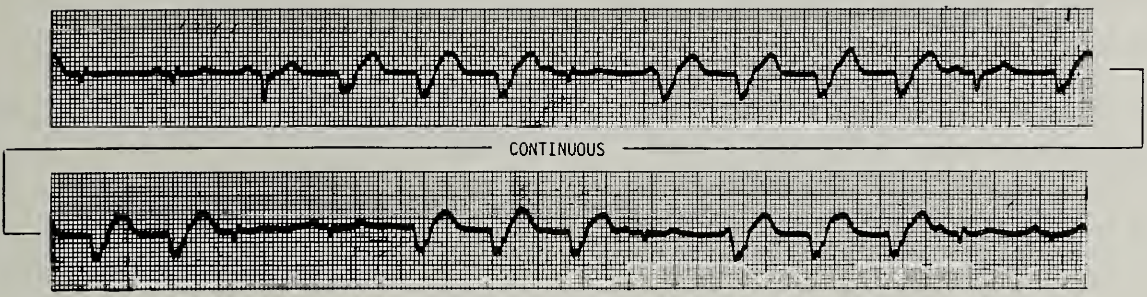

Figure 2

Accelerated idioventricular rhythm. Continuous lead 2 of a patient with recent myocardial infarction. The first two beats in the upper strip are those of normal sinus rhythm at 75 b.p.m. Note the Q wave, indicative of inferior myocardial infarction. In the two panels shown, there are five short runs of accelerated idioventricular rhythm at a rate of 88 b.p.m. The third and twelfth beats in the upper panel are fusion beats, intermediate in morphology between supraventricular and idioventricular complexes.

is predominantly present in patients with diaphragmatic infarction, often with relatively routine infarcts. It tends to be intermittent, and the heart rate is between 60 and 100 beats per minute. It usually does not cause any significant hemodynamic deterioration, and indeed it is most likely to occur during sleep when the heart rate tends to slow. It is not associated with increased mortality and does not usually warrant therapy. An example of this rhythm is shown in Figure 2.

On the other hand we have seen instances of accelerated idioventricular rhythm with the subsequent development of ventricular premature beats from this same focus. Two such patients have gone on to develop a more classical type of ventricular tachycardia. When clear-cut ventricular premature beats occur in association with idioventricular rhythm, it is my opinion that these arrhythmias should be suppressed. This can be accomplished by the use of intravenous lidocaine, although sometimes simple acceleration of the basic sinus rate will override the ventricular irritability.

A number of reports have been described in which patients have had sudden circulatory collapse with an electrocardiogram that continues to appear relatively normal. Most of these patients have had rupture of the myocardium, although occasional patients have not shown this at autopsy examination. The exact reason for this is obscure.

Summary and Conclusions

In this report, I have summarized information concerning the genesis and therapy of arrhythmias in acute myocardial infarction. The early detection and aggressive therapy of arrhythmias in acute myocardial infarction have very significantly reduced the mortality of hospitalized patients with this highly fatal disease.

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True science teaches us to doubt and, in ignorance, to refrain.
C. Bernard

THE SAN JOAQUIN FOUNDATION FOR MEDICAL CARE

• **The author reviews the organizational structure, the ingredients, and the experience of the foundation for medical care with which he is associated.**

Donald C. Harrington, M.D.

The San Joaquin County Foundation was organized under stress in 1954. An excellent Peer Review system existed there 16 years ago in the labor temple. Many of our claims in Stockton were being processed in the Labor Union Temple. There was a big blackboard there which read "Don't go to Dr. Jones, he cheats the brothers." This is happening in every community in this country right now. This is "Peer Review," but it is not performed by our peers. At the foundation, we feel that we must review our own claims and wash our dirty linen in private rather than in public.

San Joaquin County is a large geographic area (60 by 60 miles), small population (230,000), and middle in income (21% of the families have less than $3,000 per year, 34% have less than $5,000). It is mainly an agricultural county with a realignment to industry.

The organizational structure of the Foundation is, I think, extremely important. It consists of a Board of Directors of a medical society, who are indeed the managing or owning Directors of the Foundation, so that the Foundation is wholly-owned by organized medicine. It reacts to the doctors in the community, and tries to work with those crises. It is locally owned. The Board of Directors of the medical society elects a board which, in our area, consists of fifteen doctors who carry on the actual management of this program.

I would like to make one thing clear: I am a practicing, board-certified ob-gyn man, and I feel strongly that everybody involved in these programs should be practicing physicians. To allow doctors to retire into these practices of economic and administrative medicine or to pull them in as they get out of military service is, I think, absolutely wrong. I have to meet my brothers in the surgical dressing room so that I know what is going on. My own claims also have to be reviewed, which I think is very important.

The participating members of the Foundation are the members of the medical society who elect to join once a year, so that they can decide during the one-year period that the Foundation is not doing its job, and that they will not rejoin. Up to now we have had no problem with this. We have two kinds of members, the administrative members who are the Board of Directors of the medical society, and the participating members who are the physicians that form the group working with our Foundation programs. We have 19 insurance companies working with the Foundation. We have 76 groups, mostly labor management trust funds, or groups such as the teachers organization, The University of the Pacific teachers, etc.

What the Foundation Does

There are three things which the Foundation does. These, I think, are extremely important because they have to do with the management of our medical care system.

1) Standards of Care

Minimum standards are the way in which we practice medicine, interpreted through an insurance legal contract which pays for these services. As you travel eastward you will find that insurance contracts are extremely primitive. They do not cover many of the things

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This is an adaptation of a paper originally presented at the Regional Meeting of the American Society of Internal Medicine, Scottsdale, Arizona, October 1970 and published in the December issue of *The Internist*.

that should be covered, and they do not do so because the insurance industry, of necessity, has used the legal terms in the contract to perform Peer Review. "Thou shalt not take an x-ray in the office"; "thou shalt not get a blood count in your office." Why? Because they are scared to death that we will rob them blind by getting x-rays and blood counts in the office. So what happens? We put our patients in the hospitals, and they get a hospital bill too. These are the kinds of things in which insurance contracts have failed us in the past. Our criteria of care relate to medical care as it is practiced. It is just this area of insecurity in the insurance industry that has led medicine down the primrose path, but our people are rebelling now and want comprehensive care as in the Federal Employees Contract and in the structure of Medicare-Medicaid. So, the first important task is to structure the legal terms in the contracts that we stimulate the insurance industry to write. We want to practice medicine the way it is practiced in our area. The ethic of practice, the control of practice are in the hands of the physicians — not in the contract.

2) Method of Payment

We have three levels of fees in our area. Most of our Foundations do not require this — but we have a low income group of people, and we couldn't possibly live if we developed a fee that was fair for the lowest income person. So we developed a staggered series of fees for these people. In our reduction of the fees, we reduce surgery first because I can live on a half-fee for a hysterectomy, but I can't live on a half-fee for my office visits. We have administered the method in which we reduce our fees to the low income groups, and the insurance programs are written to cover these particular kinds of programs. We do, in certain occasions, pay on an hourly basis. We have a migrant farm worker program with which we have been working for some five years, and we pay according to two methods: we pay the physician $25.00 an hour plus his transportation for his time in the clinic; or we pay him a fee-for-service basis for all work done on these patients in between hours, so that our fee schedule, which our participating physicians can vote on and which reflects directly the actual charges that are being made in the community, is carried on into insurance practice. We can point out that fees are not the problem. In all of our Foundation counties that are doing review in Medicare-MediCal, we can show that utilization review — the review of too many shots, too many visits — will save approximately 15%. Review of fees will save about 1½%. So fees are not our problem in medicine.

3) Quality Control

Our problem is the total criteria of care, and the last — and extremely important — part of our program is our Quality Control Program. In all of our Foundation counties, claims are reviewed in transit. In other words, they are not paid unless they are properly processed. Our claims people are "programmed" to kick out to Physician Review those claims which we feel are not proper. Every claim has to be visualized against what we call the patient profile. We have found that there are doctors in our community, and I am sure there are some in yours, that do not seem to know that there exist such things as oral penicillin, oral antibiotics, oral iron, oral estrogen, or oral vitamins. And the percentage is not just 2%. It is higher. We have found that by locating them, bringing them in and discussing this with them, we have improved medical practice, and we have saved medical dollars which are our own since this is our community program.

The three things that we feel are important about the program are the criteria of care, the fee schedules on which we work, and the Quality Review Program.

The Foundation and the Ingredients

1) Easy Access

The population of San Joaquin County is 230,000, out of which 26,000 people are true indigents and are taken care of by the Board of Supervisors, leaving 204,000 covered under some kind of a Foundation program. 93% of the physicians of San Joaquin County are members of our Foundation.

2) Cost of Care

Cost of care should be related to other community services and to the ability of the purchaser to pay. The most comprehensive program that we have is the ILWU-PMA — International Longshoreman and Warehouseman's Union, and the Pacific Maritime Association — who joined together to form this trust fund. Throughout the rest of the state and in Oregon and Washington it is under Kaiser Permanente. The premium is $32.50. Now, I would like to point out the relationship of this amount to other services. I happen to have four sons, and up until now most of them have been getting a haircut once a month and so have I. My wife gets permanents. My haircut bill is $25.00 a month — $25.00 for haircuts and $32.50 for complete total comprehensive care! Our enemies say that we're pricing ourselves out of the market, and I say we're not. I say the fees for medical care are within reason and that they are going to escalate as we get further into hospitalization and into increasing electronic procedures in the hospital. There is no way that they cannot go up. When you think of the government taking care of the illegitimate, the blind, the lame and the aged, all of them with deficits in medical care, and they think they're going to take care of them for cheap — they're wrong. I think the time is, and has been, here for us not to apologize for our fees but to point out that they are fair and then to administer the programs to make sure that money is used for the most and best quality effectiveness.

Other Programs

There are three other programs which I think are of interest because of their novelty and the challenge they present.

1) Migrant Farm Workers Program

22,000 migrant farm workers come into our community every summer. This places a pretty heavy burden on all of us to take care of them. You cannot develop a migrant farm worker program in one county. Our migrants move from Texas across through New Mexico and Arizona and the Coachella Valley up through California into Oregon and Washington. The main reason for wanting to get involved with a migrant workers program was to see if it was insurable, and we are convinced that it is, if somebody will step up to insure it. But we do not think this is going to happen, unfortunately, so we are maintaining the posture of our present migrant farm worker program, which consists of five mobile clinics and 10 fixed clinics that take place each week. Physicians go out to them, mostly internists, generalists, pediatricians and ob-gyn men. We try to perform necessary care, and we have a referral program to other Foundation members.

2) Medical Program

This is the Medicaid Program. We in Stockton have been on risk for over a year and a half now. We are almost in our third year of covering all professional services for the Medicaid people in our area — this represents some 37,000 people. We do not cover those who are covered by Medicare, so we're covering those who are under 65, blind, disabled and AFDC. We have been able to accomplish this at a much better fee than is being received by physicians in the rest of the state. The first year we were able to pay our usual, customary, and reasonable, the second year we paid it up to the last month, and now we are going to have to pro-rate it because we are running out of funds. We have got a 7½% increase in our dues structure from the state for our third year, so I think that we are in good shape and I think that this is a pattern of practice that medicine is going to have to consider. At the present time, we have gone on risk for drugs, but we had it 100% reinsured through Pacific National Life.

3) Federal Employees Contract

We have had a Federal Employees Contract since the beginning of the Federal Contract. It is a multi-county contract, underwritten directly with the Federal Retirement Board. We take the premium dollars, and we reinsure 80% of our physicians fees with Continental Casualty, and 100% of all hospital for 1% risk. After expenses and the 1% risk, we get back any surplus to pay for professional services or to increase benefits. This has been an excellent program because it has made all the physicians aware of the fact that saving on hospital costs is netting them something. This is a very important administrative concept. Statistics show that our utilization of the Federal Employees Program is almost identical to the lumped-in Kaiser-Permanente hospitalization days per 1000. The fact that the doctors are doing this for the Federal Employees Program has improved their hospitalization everywhere else.

Health Maintenance

I want to say one more thing which I've been leading up to because of these last three programs.

HMO's — Health Maintenance Organizations can be utilized by only three groups: 1) Kaiser Permanente or other closed panel groups, 2) hospital-based programs using staff physicians, and 3) Foundations for Medical Care. The whole point of the HMO is the same as in the Federal Employees Program: it makes physicians involved. This is the one important thing that Foundations do, it produces an involved group of physicians. At the present time we have 22 Foundations in California with some 6,000 doctors that are signed up. We have a total of 8,000 physicians that are signed up under contracts throughout the country.

The Foundation, because of its local involvement, is able to relate to medical and social problems before they reach a crisis point. An example of that is our migrant farm workers program. We have kept that under control; it may not be the greatest program in the world, but at least we have got it under control. The Foundation, because of can assign people and local funds to study its administrative and financial arrangements, local problems. We are doing that with HMO to find out what our actuarial risks are and what our problems are going to be if we get involved in HMO. And finally, the Foundation, because it is an arm of local medicine, can mobilize medical manpower to produce optimal solutions and, I would say, optimal local solutions. I think this is the most important achievement of Foundations for Medical Care.

A system of care must have certain ingredients in order to produce the kind of medical care demanded by our citizens in the 1970's.

Those ingredients include:

1) Easy access to the system.

2) A price tag that is related to other services in the community and affordable by individuals, groups, and agencies of the government.

3) Comprehensiveness of coverage, including early diagnosis of disease, preventive medicine with a very small p, and continuity of care, with marked capitals.

4) Utilization of existing health care modalities and organizations of new ones.

5) Ability to work with the community at the community level with all voluntary and governmental agents relating to health care.

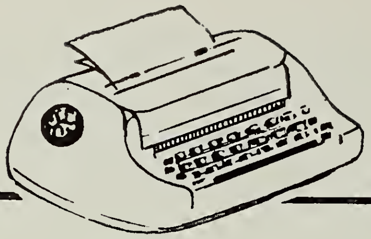
The foundation for medical care system contains these ingredients.

* * *

OUR AGE OF NUMBING

Nuclear weapons have already damaged us more than we know. They have created within us an image of historical extinction, and caused us to feel severed from both past and future. They also impose upon us every variety of psychic numbing — of emotional and intellectual anesthesia — so that we need not feel and cannot grasp their brutalizing effects upon human beings. This numbing not only interferes with our capacity to cope with the weapons themselves, but extends into all of our perceptions of living and dying.

Robert Jay Lifton, M.D., Author of Death in Life, Survivors of Hiroshima, from his address upon receiving the National Book Award in the Sciences, 1969.



Special Reports

ANNUAL CONGRESS ON MEDICAL EDUCATION, CHICAGO, ILLINOIS, February 12-15, 1971.

One of the major themes, and perhaps the most important to the community of practicing physicians, was emphasis on evaluation of the quality of care. Nobody has come up with a good yardstick to measure quality of care, but there is a great deal of discussion concerning peer review and the audit of medical records. There are many computerized systems available to assist in this, but it is evident from the overwhelming pressure on physicians' time that better simplified methods of screening charts and records will have to be developed so that this can be carried out with persons having a minimum of medical background. Evaluation of office care is an even more difficult problem.

Another topic which continues to attract a great deal of interest is the entire matter of the Physician's Assistant. There has been a noticeable cooling of the enthusiasm which was evident one or two years ago. The legal hurdles have become more apparent and especially the liability traps. There are now available training programs as short as three months and as long as five years, so that standardization of the end product does not seem possible at the present time.

In the realm of medical licensure there is considerable stress on improving our system of examinations. The FLEX system is now accepted in 30 to 35 states, and appears to be well on its way to national acceptance. The examination is difficult, but each state can set its own pass-fail level, depending on its needs and the manpower available to it. In medical schools in the past, the *time* commitment to the medical degree has been constant and achievement variable. There is now discussion of permitting time in medical school to be variable and *achievement* as measured by a uniform examination to be the constant.

Another controversial issue which aroused considerable discussion concerns American citizens in foreign medical schools. One point of view says that since these men are American citizens they should be given special treatment to permit them to serve internships in this country before they have met all legal requirements of the country in which they train. The opposing point of view is that there must be some uniform standard, and the only really enforceable one is to require that each candidate must be fully eligible to practice in the country in which he is trained before he is permitted into our internship programs. Two important new developments in this general area are: (1) Co-Trans in which American Students in foreign medical schools are permitted to take Part I of the National Board examinations, and if they pass they are eligible to transfer to a US medical school. Since the medical school bottleneck is at the level of the first and second year, this permits a larger graduating class. (2) American students in foreign medical schools may be permitted to serve clerkships in US university hospitals as part of their qualification requirements for the MD degree in a foreign medical school.

Another area of interest concerns the phasing out of internships. The AMA Council on Education has decided that all internships must be integrated with residency programs by 1975. This would provide a continuum of education from the time of the MD degree until completion of specialty training and would effectively provide a matching program for residencies, a thing which the university hospitals have been trying unsuccessfully to develop for many years.

There was some sentiment for calling on the federal government to establish a National Commission on Medical Education which would have sweeping supervisory powers over the entire medical educational effort of the nation. Needless to say there was considerable emotional response to this proposal, both pro and con.

E. Wayne Martz, M.D.

Dr. Martz is Director of Medical Education, Wilmington Medical Center.

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Highlights

TREATMENT OF PERIPHERAL ARTERIAL DISEASE

David Naide, M.D. — *Vascular Section, Department of Medicine, Graduate Hospital of University of Pennsylvania; Presented to the Delaware Academy of General Practice.*

Arteriosclerosis obliterans is usually a generalized process, but may be localized. It is rare in the upper extremity and involves males and females approximately equally. The most common complaint of the patient with arterial insufficiency is intermittent claudication. He describes crampy discomfort in his leg muscles after walking. This causes him to stop and rest for a short time, after which he can again walk a short distance. The physician must also inquire for coldness, numbness and discoloration of the feet. When the degree of ischemia is severe, patients may also complain of pain at rest. The degree of symptoms depends to a large extent on the development or lack of development of collaterals.

On examining these patients, all pulses must be examined for, including the femoral, popliteal, dorsalis pedis, posterior tibial, radial, and carotids. One should listen for bruits, particularly over the carotids, abdominal vessels, and femoral vessels. Oscillations can be checked, even with an ordinary sphygmomanometer. Also to be looked for are excessive blanching of the feet on elevation, any delay in flushing time after dependency or venous filling time after elevation, or the development of rubor on prolonged dependency. A patient with rubor has advanced ischemia.

The skin of the feet should be checked for trophic changes, absence of hair growth, or any break in the skin. If a patient has severe ischemia, particularly when of recent onset, there may be diminished sensory and/or motor function in the extremity. Patients with a low femoral or upper popliteal occlusion may have increased warmth in that knee because of shunting of blood through the geniculate arteries, which are acting as collaterals.

The special methods of evaluating these patients include, first of all, plain x-rays to look for arterial calcification. Vasodilatation tests are done by measuring the temperature response of the toes to body heating in a constant temperature room. Other methods of blood flow measurement are primarily useful for research and not on a clinical basis. When arterial reconstructive surgery is being considered, arteriography is necesary.

Occasionally one sees patients with a typical history of intermittent claudication, who have perfectly normal pulses. Several conditions may cause this problem. With a proximal area of stenosis due to atherosclerosis, pulses may be normal at rest but decrease with ex-

Table I

These are the printed directions given to patients in the University of Pennsylvania Arterial Disease Clinic.

IMPORTANT PREVENTIVE MEASURES

To keep the circulation open and the skin in good condition.

1. **NEVER USE TOBACCO in any form.** Tobacco contracts blood vessels and so reduces circulation.
2. **KEEP WARM.** Cold contracts blood vessels and reduces circulation.
3. Take great care that the foot is not injured. Avoid crowded places.
4. **Wear wide-toed shoes** which cause no pressure, and have adequate arch support. **Use thick, warm, loose socks.**
5. Do not wear circular garters. Elastic bands compress blood vessels and reduce blood flow.
6. Do not sit with the knees crossed. This may compress the leg artery and shut off blood supply.
7. If the weight of the bedclothes is uncomfortable, place a pillow to hold the bedclothes above the feet.
8. **Do not apply any medicine to the feet without directions from a physician.** Some ordinary medicines are too strong for feet such as yours with poor circulation.
9. **DO NOT APPLY ANY HEAT TO THE AFFECTED LIMB** without a doctor's consent. Even moderate heat can injure the skin of a leg with poor circulation.
10. Wash the feet at least every other day with warm water and soap. Dry thoroughly, especially between the toes, by mopping, not rubbing.
11. If the feet are dry and scaly, apply lanolin.
12. If the feet are moist, use powder.
13. Before cutting nails, soak feet in warm (not hot) water ten minutes to soften nails. Cut straight across. Don't cut down into the corners. Do not cut them close to the flesh. If you are treated by a podiatrist, tell him that your blood flow is reduced.
14. **Proper first-aid treatment is important. Consult your physician promptly** for any redness, blistering, pain or swelling. Any break in the skin may become an ulcer or gangrene unless properly treated by a physician.
15. **Athlete's foot** which starts out with peeling and itching between the toes **should be treated immediately by your physician.**
16. Place lamb's wool between the toes.
17. Do not bathe in cold water or in the ocean.
18. Avoid sunburn.
19. Walk slower, but walk often.

* * *

ercise. Occasionally, patients are seen with muscular artery occlusion, due to micro-emboli or small vessel disease, such as polyarteritis; these cases may have claudication with normal peripheral pulses. A rare entity causing this situation is "spinal claudication"; these patients may have musculoskeletal problems, with no vascular disease at all; their problem is neurologic in origin.

The most important factor in the non-surgical treatment of peripheral arterial insufficiency is prophylactic foot care. These patients must be advised on proper care of the skin and toenails in order to prevent any unnecessary trauma. They must not put their feet in very cold water, such as the ocean, if the water temperature is below 72°, and must take care not to step on any sharp objects. For patients with intermittent claudication, a program of gradually increasing exercise, particularly walking, is most helpful in developing collaterals and reducing symptoms. Giving the patient a printed sheet with these instructions is important. (Table 1) Vasocilator drugs are of some value in these patients, although it is difficult to document increased blood flow with these drugs by objective measurements. As a general rule, there is no evidence that anticoagulants are of benefit in preventing progression or bringing about improvement of arterial disease. The serum lipids (cholesterol and triglycerides) should be checked in the fasting state; and if these are elevated, appropriate diet and/or drug therapy is indicated.

If the patient has an ischemic lesion on the foot which is not improving, has rest pain which is persistent, or has severe claudication, particularly if it is interfering with his occupation, then arterial reconstructive surgery must be considered. Prior to surgery, angiography is performed to see the location and extent of occlusion and the status of the peripheral run-off. An occlusion below the groin, such as in the superficial femoral artery, is usually treated by a femoral-popliteal saphenous vein by-pass graft. Occasionally, by-passes are performed with veins to the smaller vessels below the knee, such as the tibial or peroneal vessels. If the occlusion is above the groin, such as in the aorta or iliac arteries, the by-pass is performed with a synthetic graft. Rarely, for very localized occlusions, endarterectomy can be performed. Lumbar sympathectomy, either alone or in combination with a reconstructive procedure, is done on occasion; this is most helpful for increasing skin blood flow as opposed to muscle blood flow.

In summary, patients with peripheral arterial disease must be thoroughly evaluated by means of history, physical examination, and special studies when indicated. When symptoms are not severe, they can be managed conservatively. In this situation, prophylaxis is of utmost importance in the prevention of the development of gangrene. When symptoms are more severe, arterial reconstructive surgery has to be considered. It is well to bear in mind that many patients with peripheral arterial disease have other associated diseases, such as cardiac or pulmonary problems. There is no point in subjecting a patient to arterial reconstructive surgery to reduce his intermittent claudication, if he will then not be able to walk any further or faster because of severe angina causing chest pain or emphysema causing shortness of breath.

* * *

BOOK REVIEW

MEDICINES FOR MAN

HARRY F. DOWLING, M.D.

As Dr. Dowling points with painstaking documentation — each chapter is referenced by up to 80 source documents — the average physician practices 45 years. But the average medical student gets very little training in the mechanisms of drugs and the method of evaluating new ones. And the average practicing physician is apt, unless he is very, very careful, to receive his education, especially in the choice of new drugs for his patients, from the men who stand to gain money if he orders their particular pharmaceutical wares.

(The drug detail man whom I remember as probably the most honest is the one who after he finished his rehearsed spiel, told me there was an additional nutritive reason I should prescribe his form of penicillin or whatever.

"Nutritive?" I asked in surprise.

"Nutritive," he insisted. "If you don't write for this brand of penicillin, my wife and kids don't eat.")

Dr. Dowling lucidly traces the present development of our pharmacologic armamentarium, to use an apt cliché, from simpler times when, as the Committee on Public Health of the New York Academy of Medicine stated, the industry made what the physician prescribed rather than, as now, the physician prescribes what the industry makes.

The problem is a complex one, and Dr. Dowling explores it thoroughly, including the FDA, past and present, and the generic controversy. How many psychiatrists would recognize their everyday friend by its real chemical name of 2-chloro-10 (3-[4-methyl-l-piperaznyl]propyl)phenothiazine? Well, how about by its generic name, prochlorperazine?

Dr. Dowling is Medical Consultant to the Division of Health Sciences, University of Delaware.

Now, how about by its Smith, Kline and French trademarked name, *Compazine?*

In 1860, Oliver Wendell Holmes stated that excepting opium, the anesthetics, and a very few other medicaments, "if the whole *materia medica* as now used could be sunk to the bottom of the sea, it would be all the better for mankind — and all the worse for the fishes."

The drug companies understandably have put some of the responsibility for the present state of modern pharmacotherapeutics onto the shoulders of the man with the prescription pad:

"What these howls of outrage and hurt amount to is that the medical profession is distressed to find its high opinion of itself not shared by writers of ethical drug advertising. It would be a great step forward if doctors stopped bemoaning this attack on their professional maturity and began recognizing how thoroughly justified it is."

Dr. Dowling lists all the present objective sources for drug information available to the practicing physician. He recommends as the best the ADE (AMA Drug Evaluation) which has recently been published.

Dr. Dowling has neatly summed his book[1] up in its subtitle: "the development, regulation, and use of prescription drugs." We enjoyed it and recommend it to all physicians who own prescription pads. Besides being useful, it may help them to avoid patients whose epitaph might be the clever couplet of Matthew Prior, written more than two hundred years ago, but regrettably too apt today:

Cur'd yesterday of my disease,
I died last night of my physician.

B.Z.P.

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[1] *Medicines for Man*, A. Knopf, 1970.

* * *

Deaths

DR. RICHARD H. PRICE

Dr. Richard H. Price died on May 5, 1971, at age 75. Dr. Price had been a resident of this area for many years although a native of Auburn, New York.

Dr. Price received his medical training at the College of Physicians and Surgeons in Boston; he was certified by the American Board of Psychiatry and Neurology in 1942. He came to Wilmington as Assistant Medical Director for the E. I. duPont Company after having served in the Public Health Service. He was with duPont from 1927 to 1937, then re-entered the Public Health Service.

During World War II and the Korean War, Dr. Price served with the Navy and retired as a Captain in 1954. He then served as head of the neuropsychiatric service at the Veterans Administration Hospital at Elsmere, then entered private practice in Newark. He had been a patient in the Philadelphia Naval Hospital for five years prior to his death.

He is survived by his wife, Minerva Dresh Price; a daughter, Mrs. David Lermond, North Hills; and a son, Major Andrew Price, a medical doctor with the US Army in Germany.

DR. CALEB H. SMITH

Dr. Caleb H. Smith died on April 27, 1971, of a heart attack. He was 62 at death.

Dr. Smith was a native of Philipsburg, Pa. who had been in practice in Wilmington since 1955. He was a graduate of the University of Pennsylvania School of Medicine, served a residency at the Mayo clinic, and received a Master's degree in surgery at the University of Minnesota. He subspecialized in proctology and later taught surgery and proctology at the University of Rochester and Temple University School of Medicine.

Dr. Smith served in the Korean War as a chief of surgery in the Army and later worked at Project Concern, a floating clinic in Hong Kong Harbor.

Dr. Smith was an associate member in the Department of Surgery, Section of Proctology, and Section Chief of Proctology, Wilmington Medical Center.

One of his main non-medical interests was jazz, and he had known and collected the records of many of the greats in American jazz.

He is survived by a son, Caleb H. Smith, Jr., of Wilmington; a daughter, Priscilla Jane Smith of Middletown; and a brother Donald E. Smith of San Antonio, Texas.

Editorials

WHAT HEALTH CARE COSTS?

There is palpable and justifiable concern about the "sky-rocketing cost of health care." It is time to set the record straight.

When a ghetto child must receive prolonged and expensive medical treatment for lead-poisoning, the cost should be computed as a subsidy to slum-lords—not as a cost of health care.

When 250,000 people are seriously burned each year when burning clothing incinerates them, the cost of medical treatment is a subsidy to the textile industry which successfully resists legislation to outlaw flammable clothing—not a cost of health care.

When accidents account for 113,000 deaths and 2,000,000 serious injuries at a cost of twenty-five billion dollars each year and half of the dismal toll is due to *vehicular* accidents, that half should be considered as a national subsidy to the automotive, petroleum, and cement industries—not as a cost of health care.

When 20,000 people are killed and ten times that number seriously wounded each year by firearms, the high cost of the prolonged hospitalization required should be considered as the nation's tribute to the arms industry and its empty-minded lackey, the National Rifle Association—not as a cost of health care.

When 20 cents or more of the visible health cost dollar is dissipated by the administrative costs and inept practices of the health insurance industry and bungling government bureaucracies, the loss should be charged to these profit-making organizations and cumbersome government agencies—not as a cost of health care.

When people with crippling respiratory diseases must undergo medical treatment for the remainder of their blue-lipped, panting lives, the cost of treatment is a subsidy to the industrial pollutors—not a cost of health care.

This list could be continued on and on — losing poignancy and immediacy through the sheer weight of deadening and appalling, monotonous repetition. To state that all these people are paying with their health and lives, as well as with their own and public money, is to underscore the obvious.

The membership of the AMA is dwindling rapidly. I suspect that physicians practicing at the community level are becoming increasingly aware that the AMA leadership has developed the same mentality as the gray-flannel establishment club that has created the real estate lobby, the gun lobby, the automotive lobby, the insurance lobby, etc., etc. The time is ripe for these concerned community physicians, the majority of physicians in the country, to wrest control of organized medicine from the Neanderthalers and become the real health lobby for the public which we serve. We should then campaign vigorously for correctives, instead of palliatives.

Harold S. Rafal, M.D.

THE CORONARY CARE UNIT

The concept of acute coronary care as practiced in today's Coronary Care Units (CCU) has become well established in modern medicine. Recent medical literature is replete with experiences from units throughout the country, and from these, several generalizations have been derived.

The incidence of arrhythmias in acute myocardial infarcts in the range of 75-90% is much commoner than previously thought.[1,2] It is the early detection and treatment of these arrhythmias that have been responsible for the significant reduction in mortality from the acute myocardial infarct to about 15-30%.[1-3] In this regard acute coronary care is in a large measure prophylactic in nature against the life-threatening arrhythmias.

The dangers from a fatal arrhythmia are greatest in the first several hours following the infarct, and this has led many investigators to explore the feasibility of mobile

CCU's to provide early cardiac monitoring. In one report, 64% of all CCU deaths occurred in the first 24 hours of admission.[1]

The morbidity and mortality resulting from severely impaired left ventricular function and pump failure have remained unchanged. Early surgical intervention for the ruptured ventricle and aneurysectomy may offer some hope for a small number of patients but is not yet available at the Wilmington Medical Center. Aortic counterpulsation still remains investigational.

In addition to the above, another interesting concept has been put forth by Lown and others in regards to admission criteria to the CCU. They claim that the diagnostic accuracy for patients admitted with possible infarcts should not exceed 75%. This is to assure that patients with atypical or equivocal presenting signs are not missed and thus denied the benefits of optimum medical care. Obviously this depends upon the type of preadmission screening available at any given hospital and the availability of beds in the CCU. At our institution, where most of the admissions to CCU are screened first in the emergency room, the diagnostic accuracy has been 81% (232 of 263 admissions). This percentage may actually be higher than 81% since it is our policy to admit patients to the CCU for arrhythmia management in the absence of an acute infarct. At this time there is no way of knowing whether or not a significant number of patients are in fact being denied needed coronary care.

Concerning those patients that are admitted to the Unit, and there have been 263 since its opening in the fall of 1970, 26 of the 232 patients with proven infarcts have died, for a mortality rate of 11%. This does not include follow-up after discharge from the CCU. These figures indicate that the CCU is fulfilling its purpose for those patients that are admitted to the Unit. They do not prove or disprove that the Wilmington Medical Center is fulfilling its obligation to the population area which it serves. To establish this fact, the number of admissions to areas other than the CCU and their course and outcome must be known. This is in addition to follow-up of patients after they have left the CCU. Only then will the significance of the 81% diagnostic accuracy and the 11% mortality rate become clear.

William F. Renzulli, M.D.

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BOTULISM

The recent outbreak of food poisoning due to *Clostridium botulinum* in West Chester County, New York, received considerable public attention. This tragic episode resulted from the consumption of commercially prepared cold vichyssoise, and it should be noted that this is only the third instance of botulism in the United States in the past twenty years that has been traced to a commercial food source. The vast majority of such cases of poisoning result from inadequate home canning processes.

Botulism is a relatively rare cause of food poisoning, but the universal occurrence of this pathogen in soil, vegetables and aquatic life poses a constant threat. Since successful treatment depends upon rapid diagnosis, the clinician must maintain a high index of suspicion to overcome the disadvantage of no previous clinical exposure to the disease. (There have been no reported outbreaks of botulism in Delaware since 1899.)

The first clue to the diagnosis of botulism may be the history of consuming sour-tasting, home-canned food. The early clinical picture most often suggests food poisoning or a neurological syndrome. Diplopia, dysphagia, dysarthria, ptosis of the eyelids and severe dryness of the mouth should prompt the physician to suspect botulism. While the disease process might mimic a symmetrical neurological syndrome, the absence of sensory changes with striking mental clearness is classical in patients suffering from botulism. The temperature and pulse are usually normal until late in the disease when secondary infection may cloud the clinical picture.

Treatment in the early stage of the disease should be directed to attempts to empty the gastrointestinal tract and free the intestinal mucosa of the toxin produced by *Clostridium botulinum.* If there is respiratory weakness, tracheostomy and artificial ventilation will be necessary. Blood should be drawn immediately and forwarded through the State Health Laboratories for detection and identification of the offending toxin. Antitoxin can be obtained from the Communicable Disease Center through the State Department of Health and should be administered early in the course of the disease. Recent reports[1,2] suggest that the use of guanidine hydrochloride results in rapid improvement in the neuromuscular block of botulism in man and animals. While this blocking agent has not yet received official sanction in the treatment of cases of botulism, it would appear that the seriously ill patient should not be denied the possible benefit of this drug while bearing in mind the reported side effects including diarrhea, salivation, vomiting, hypoglycemia, tremors, muscle twitching and paresthesias.

A more controversial adjunct to the treatment of cases of food poisoning due to *Cl. botulinum* is the use of penicillin. There is some laboratory evidence[3] to suggest that toxin may be released *in vivo* following the germination of spores, and for this reason penicillin might be valuable early in the treatment of this infection.

The successful treatment of a case of poisoning due to botulism depends upon the early suspicion of this infection by the physician. The above suggestions for rapid effective therapy can best be strengthened by rapid consultation with the State Health Department and the National Center for Disease Control.

W.J.H.

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2. Cherington M and Ryan DW: Treatment of botulism with guanidine. NEJM 282:195-197, 1970.
3. Haller HD, May RT, and Roth RL: Botulism — a case report. Journ of Kentucky Medical Association 67:820-822, November 1969.

SMAC AND NORTHEAST: A List of Names

In the past year two innovative attempts to deal with the problem of unmet medical needs in Wilmington have quietly come into existence and are now actively operational. The Northeast Medical Group, working in the first state service center to be opened in the Wilmington area, is headed by Jack Gelb and numbers fourteen general practitioners whose names we list below because we believe they deserve congratulations and appreciation. In a time of problems, they are part of the solution. The Southbridge Medical Activities Center, largely the offspring of Allston Morris, as pragmatic as he is idealistic, is even more remarkable because its list of fifteen physicians is motley, including, as well as internists and generalists, surgeons, pediatricians, an anesthesiologist, and a student health physician. The effective functioning of this latter group of doctors is to us particularly noteworthy because of its enormous implications regarding the solution of the provision of primary care with a dearth of purely primary physicians. We, alas, are not convinced that the present dearth of research-oriented funding to medical schools, and their resultant interest in and adulation of the now renamed general practitioner will ever reverse the trend away from specialization. Unless *all* first line medical care is going to be administered by machines or nonphysicians, it seems likely that physicians of all specialties will increasingly find themselves required to serve part-time as primary physicians. Chiefs are and will continue to be in fine supply; what this here country needs is Indians.

Both of these community health facilities are operated in the same fashion. The physicians are present Monday through Thursday from 6 to 8 p.m. and on Saturday morning. The rest of the time their health-oriented activities are carried on under the supervision at SMAC of Mrs. Bessie Bungy, who is an LPN, and at Northeast of Mrs. Bernadette Kornegay. Mrs. Bungy had the benefit prior to the opening of the SMAC center of the community health-agency orientation program directed by Dr. William Duncan, originator of the community health coordinator concept in this area.

The SMAC facility has had the efficient managerial mothering of Mr. Jan DeLong of the Health Planning Council.

Both health centers include complete pharmacy services staffed by volunteers, including a husband and wife and a father and daughter, from the Pharmacy Associates, Inc.

Credit, where credit is truly due:

Pharmacists (work at NEMC and/or SMAC)

M. L. Andersen
R. Andersen
G. Block
R. L. Davis
M. F. Garvey
A. G. Konizer
D. J. Krigstein
J. R. Kukulich
A. M. Lauter
R. H. Margolin
E. A. McGee
W. E. Merritt, Sr.
P. P. Potocki
H. Rappaport
R. Rowsey
S. H. Weinberg
A. Whiteman

Pharmacy Students

M. Boyer
L. Garvey
K. Schumann
W. Smyth
S. Witkowski

Pharmacy Assistant

C. Hicken

Northeast Physicians

M. Amini, M.D.
G. J. Boines, M.D.
F. M. Brown, M.D.
I. Charamella, M.D.
J. Gelb, M.D.
J. H. Hanel, M.D.
E. M. Kendle, M.D.
D. W. MacKelcan, M.D.
D. Messinger, D.O.
W. D. Shellenberger, M.D.
S. Stat, M.D.
C. P. Turner, M.D.
M. A. Woolley, M.D.
W. A. Wright, M.D.

SMAC Physicians

R. T. Beattie, M.D.
J. L. Campbell, M.D.
V. DelDuca, M.D.
C. I. Glassman, M.D.
G. Keppel, M.D.
G. Klein, M.D.
D. H. McGee, M.D.
P. J. Mette, M.D.
E. R. Miller, Jr., M.D.
A. J. Morris, M.D.
C. Mulveny, M.D.
R. W. Powell, M.D.
C. S. Riegel, M.D.
D. E. Saunders, M.D.
R. A. Teixido, M.D.

Other physicians who wish to volunteer to work one two-hour session every two weeks will be heartily welcomed; they are needed.

B.Z.P.

EVERYTHING YOU OUGHT TO KNOW ABOUT SEX

The morning session of the Medical Society of Delaware's annual meeting which will be held in Dover on October 9 will feature Dr. Edward Tyler, professor of psychiatry at the Indiana University School of Medicine. There, Dr. Tyler presents a sex course each spring to second-year medical students, a course which was in part begun when a student wrote to *Playboy* lamenting the paucity of the sex education he was receiving in school.

Dr. Tyler aims in his course to "increase the student's awareness of the wide variety of sexual problems that exist and help him decide whether or not to include sex counseling in his practice, to make the student more tolerant of the wide spectrum of 'normal' sexual response and force him to think about the different points of view on controversial ones, to convince the student that the physician who treats sexual problems has the right of access to very personal data from his patients, and to introduce the student to diagnostic tools, therapeutic techniques, and preventive procedures and material."[1]

Early in the course, the teaching materials include "stag films" (for desensitizing purposes) as well as other films from the Kinsey Institute's library of pornography to render the students immune from shock.

Save the date: Dr. Tyler is coming to town.

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[1] *Hospital Physician,* October 1970

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TRISTIMANIA

I wish I could substitute a better term than hypochondriasis. It has unfortunately been supposed to imply an imaginary disease only. It is true, it is seated in the mind, but it is as much the effect of corporeal causes as a pleurisy or a bilious fever. Perhaps the term *tristimania* might be used to express this form of madness when erroneous opinions respecting a man's person, affairs, or condition, are the subjects of his distress.

Dr. Benjamin Rush

EARLY DELAWARE PHYSICIANS

ANOTHER EARLY DELAWARE PHYSICIAN: DR. WILLIAM THORNTON

HARRIET DURHAM

In a recent issue of the Delaware Medical Journal,[1] W. E. Wilson, a fine and accurate historian, accidentally and amusingly implied that Dr. Nathaniel Luff was unable to cope with being a physician and a Quaker concurrently. Luff's actual reason for giving up the practice of medicine was the inability of his patients to pay satisfactory fees. This was an unusual decision for a Quaker in a period when many members of the Society of Friends, though among the plainest, were among the most affluent in many cities and communities.

Historically, Quakers had been prevented from entering public office, denied glory in the military because of their religious tenets, and outdone in money lending (in the United States) by other groups. They thus very frequently turned to medicine to satisfy their drive to serve others as directed by George Fox's* admonition: "Let your lives speak." Thus, we had Moses Shepherd of Baltimore, Dr. John Coakley Lettson of London, Dr. Benjamin Rush of Philadelphia and Dr. William Thornton.[2]

Wilmington enjoyed the presence of Dr. William Thornton, an erudite Quaker physician, for somewhat more than one year, probably beginning late in 1787. His reason for moving to Wilmington is unknown and although his stay was brief, several episodes were milestones in the life of this man of amazingly varied talents.

Shortly after his arrival, on January 7, 1788, he took his "oath of fidelity," now referred to as obtaining US citizenship, he being a British subject born in the West Indies on the island of Tortola in the Virgin Islands, West Indies. Although his early manhood was spent in England obtaining his medical education, he was enamored with young America. Once allied to the new nation, his life was devoted to its betterment. No record of his naturalization can be found in the Public Archives of the State of Delaware. However, in his innumerable letters to friends and family, he writes with pride of his decision and affirmation.

Thornton dined, traveled, and corresponded with the great and near-great. It is not surprising that one of the few stories remaining of his "Wilmington period" concerned our great statesman, John Dickinson, another Quaker. In April of 1788, Thornton wrote to his parents: "I applied to Governor Dickinson for permission to address his daughter, but he thinks her too young by several years, and knows no objection whatever to me." He failed to mention which daughter he had requested, but by studying their birthdates, we may safely assume it was Sally, who was seventeen years old at the time. The Governor should have given second thought to this offer as plain Sally was destined to remain unmarried.

Thornton is most commonly known for his innate and superlative ability as an architect. Among Dickinson's papers, there is a notation: "Folding Front Door finished according to Dr. Thornton Draft." Thornton was later designer of the Capitol buildings in Washington, D.C., but his most perfect gems were probably houses of his design — some extant — and bits and pieces of others. Dickinson's front door was no doubt one of these bits.

Thornton had given up the actual practice of medicine for the finer pursuits of a gentleman with a private income: campaigning for abolition, painting, writing, inventing an international language, serving as a favored dinner guest, experimental farming, making ingenious inventions of great use apparently for his own amusement only.

The epilogue to his year in Wilmington is one of whimsical irony. He returned to Philadelphia to marry Ann Brodeau, aged 15. For this he was disowned by the Society of Friends for "marrying out of Meeting."

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*George Fox, an Englishman, was the driving force and original leader of a group that was to become the Society of Friends, known as "Quakers."

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1. Delaware Medical Journal, August 1970, 215.
2. Biography in preparation.

Delaware Academy of General Practice

LEGISLATIVE NOTES

Efforts are being made to reintroduce legislation in the House of Representatives similar to the ill-fated Rooney-Yarborough bill which succumbed to President Nixon's pocket veto last December. H. R. 8321, introduced by Representative Thaddeus J. Dulski (N.Y.), is identical to the American Academy of General Practice's family practice education bill which called for a three-year $225 million program to train family physicians. The original bill passed both houses of Congress with only three dissenting votes.

The Academy has also declared its support for the Comprehensive Health Manpower Training Act of 1971 (H. R. 8629), which would authorize grants totaling $100 million during the next three years to establish family practice training programs in "public or private non-profit hospitals and other health or educational entities." The bill provides funds for special project grants to medical and osteopathic schools. Two of the goals are: (1) to "effect significant improvements in . . . the establishment of new, or expansion of existing, programs for training in family medicine"; (2) to provide traineeship for preceptees in family practice, pediatrics, or internal medicine.

The Academy has also officially indorsed and supported the AMA Medicredit proposal in lieu of other national health insurance proposals before Congress at the present time.

RECENTLY PASSED DELAWARE LEGISLATION

Physicians — It is now the law!!

Physician Assistant Bill Passes

The following addition to the Medical Practice Act was made during the last session of the Delaware General Assembly: "Nothing contained in this Chapter (Medicine, Surgery, and Osteopathy) shall prevent any person from rendering medical, surgical, or health services, if such services are rendered by such person under the supervision and control of a physician or surgeon, licensed under this Chapter. Nothing herein shall be construed to change or modify legitimate practices currently prevailing in the practice of optometry or ophthalmology."

Labeling of Prescriptions

Any person prescribing any drug to be prepared by a pharmacist for the use of a patient or any third person must, as a part of the prescription, include direction describing the exact method by which the drug or medicine prescribed must be taken or administered. Blank prescriptions or prescriptions bearing the notation 'as directed' are prohibited.

Any pharmacist licensed within this State to dispense drugs or fill prescriptions issued by physicians, dentists or veterinarians shall affix to every container in which any drug is sold or dispensed a label containing the following information:

1. The prescription number;
2. The date such drugs were originally dispensed to the patient;
3. The patient's full name;
4. The brand or established name and the strength of the drug to the extent that it can be measured;
5. The physician's directions as found on the prescription;
6. The physician's name;
7. The name of the pharmacy.

Physicians who, for good reason, do not wish to reveal the name or strength of the drug prescribed to the patient shall so inform the pharmacist by a notation on the face of the prescription. However, physicians who sell or dispense drugs directly to patients shall label all such drugs in accordance with this Section."

President's Page

A MATTER FOR YOUR PERSONAL ATTENTION

Can we pay the price? Do we want the services? Are they worth the price? These are the questions that each physician of the Medical Society of Delaware should weigh and then vote to raise his own taxation.

There is no denying that as physicians we are involved in the political arena as advisors about medicine and its allied health care disciplines. The Public Laws Committee is our direct investigative committee of all medical and health-related legislation. The number of bills considered has increased five-fold in the last six years. Just having meetings and distributing copies of each bill are expensive items.

The Health Care Delivery Committee is subdivided into many task forces. The men on these committees give of their time, but the work of gathering, tabulating, and disseminating the information is time-consuming and costly.

The Prepayment Committee has had more meetings and disseminated more written reports than ever before. This committee will be called on to watch even more closely affairs with Blue Shield since we will no longer have Board members after November 1, 1971.

Other new committees have been created at new cost to us: Peer Review and Professional Evaluation, Liability Insurance, and Drug Abuse. The executive office has assumed the work of the Medico-Legal Committee as a duty and also as a financial responsibility.

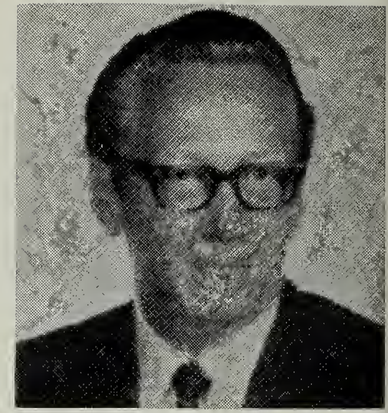
Increased involvement in all these areas means more expensive operation of the executive office. The cost of the office space itself has increased 25%, effective July 1, with an additional charge being imposed for all evening meetings. We have reason to call on our legal counsel more and more. We are caught in the inflational spiral just like everyone else.

No salary increases, other than to compensate for the cost-of-living increase, have been made in the last three years. The Society's tax obligation for its employees has increased so that this is an item which also must be increased in the budget. Office expenses themselves have increased as we must all be aware in our own offices. Presidents are being asked to give up more of their time from their offices and more travel in the name of the Society. At present only out-of-pocket expenses are reimbursed; in the future the President's time should be paid for in a more realistic fashion.

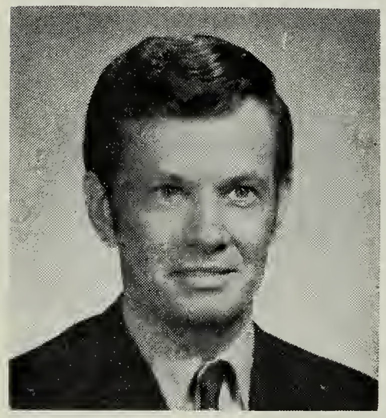
In the light of all these things we must consider the necessity for a dues increase for the Society. I propose a one hundred dollar increase be brought before the House of Delegates.

Rhoslyn J Bishoff

New Members

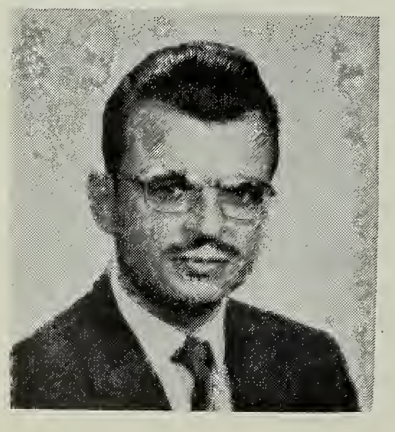


David S. Howard, M.D. can truthfully say, "I'm from Missouri." He graduated from Baylor University College of Medicine, '47, interned at the St. Louis City Hospital, and served residencies at Children's Mercy Hospital and Kansas City General Hospital, both in Kansas City, Missouri. Previously in practice in San Antonio, Texas, Dr. Howard is a board-certified pediatrician practicing in Ocean View. He and his family reside in Bethany Beach.



M. Cornelius Hoffman, M.D., is a native of the Republic of South Africa. He is a 1955 graduate of the University of Leiden, the Netherlands. He interned at Johnston Willis Hospital, Richmond, Virginia, and was a resident at the Crawford W. Long Hospital, Atlanta, Georgia. Dr. Hoffman's specialty is obstetrics-gynecology in which he is board-certified. His office is at 1509 Gilpin Avenue, Wilmington. Dr. and Mrs. Hoffman and their three children are townhouse dwellers in Wilmington. Among Dr. Hoffman's extra-curricular interests are skiing, tennis, antique automobiles, and raising Black Angus cattle.

George P. Liarakos, M.D., a native of Greece, is a graduate of the University of Pennsylvania School of Medicine, '63. He served an internship and a residency at Lankenau Hospital. Dr. Liarakos is a board-certified obstetrician-gynecologist with an office in the Professional Building, Wilmington. He and his wife are the parents of a young daughter.



Nejat M. Tajen, M.D., a general surgeon practicing in Seaford, was born in Cyprus. Dr. Tajen is a graduate of the Faculty of Medicine, University of Istanbul, '60. He served internships at Farnham Hospital in Farnham, England, and St. John's Episcopal Hospital, Brooklyn, New York. His residencies were in Charleston, W. Virginia, at the Charleston General Hospital; in London, Ontario, at Victoria Hospital; in Morgantown, W. Virginia, at West Virginia Medical Center; and in Toronto, Ontario, at the Hospital for Sick Children. Certified in 1968 in general surgery, Doctor Tajen is a member of the International College of Surgeons.

In Brief

AMA House of Delegates

The AMA House of Delegates, at the 120th Annual Convention in Atlantic City voted to expand and strengthen the AMA program to combat drug dependence and urged state and local medical societies to give priority to the program at the community level. It also called on individual MD's to give special attention to problems of drug abuse and to volunteer their efforts in community programs.

In separate actions related to drug dependence, the House went on record as favoring measures for the prevention and treatment of addicts within the armed forces; urged physicians to limit their use of amphetamines and other stimulant drugs to specific medical indications; supported the Bureau of Narcotics and Dangerous Drugs' proposal to establish manufacturing quotas for amphetamines and methamphetamines.

In other actions, the House urged more federal and private financial support for medical students; voted to permit American-born foreign medical graduates to participate in approved internship programs without satisfying the internship and social service requirements of the foreign school; recommended that individual members of the AMA become sustaining members in the Student American Medical Association.

Outgoing AMA President, Walter C. Bornemeier, M.D., in his final report to the House, said availability of medical care should be the chief concern of medicine at this time. If comprehensive care is provided in the population centers on a 24-hour basis, he said, "the people will tell Congress that the present system does not need to be restructured." He predicted a comeback for the family physician and a strong trend toward group practice in the years ahead. He urged that grants or low-cost loans be made by the federal government to physicians who want to set up private practice groups in areas of need.

From the June 28, 1971 issue of the *AMA Newsletter.*

182nd Annual Meeting

Check the September issue of the *Delaware Medical Journal* for the complete program for the Annual Meeting of the Medical Society of Delaware. Besides Dr. Tyler's exciting Sex Seminar (see page 228) there will be presentations by Ernest B. Howard, M.D., Executive Vice President of AMA, and Julian Bond, the Georgia legislator. Mark your calendar now to save October 8 (House of Delegates) and 9 (Socio-Scientific Session, Annual Dinner Dance). We think it'll be a meeting to remember.

Plan Now For Art Exhibit, October 9

Doctor, do you enjoy painting, sculpting, photography, crafts and/or pottery-making? How about the Mrs.?

If so, you will have a chance to show off your efforts at the Physicians' Art Exhibit planned as a feature of the 1971 MSD Annual Session October 8-9 in Dover. The art show will be set up in Dover Downs. Contact the Medical Society of Delaware office for an application blank.

Speakers on "Ask the Doctor"

Speakers for September 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: September 7, Joseph Glick, M.D., *Methadone Clinic;* September 14, Bayard R. Vincent, M.D., *Cataracts;* September 21, Sanford G. Rogg, M.D., *The Value of Work in Keeping Healthy;* September 28, Charles Riegel, M.D., *Disability.*

CLINICAL NOTICES AND MEETINGS

AHA Continuing Education

The American Heart Association Council on Clinical Cardiology will present Three Days of Cardiology, *No. 37, Coronary Disease: 1971* in Cleveland, Ohio, September 22-24 and *No. 38, Modern Management of the Acute Cardiac Patient* in Miami, Florida, October 7-9, 1971. For information write: Miss Carole Mintz, American Heart Association, 44 East 23rd Street, New York, N. Y., 10010.

Annual Scientific Sessions

The *Annual Scientific Sessions* sponsored by the American Heart Association, Texas Affiliate, and Southwestern Medical School will be held in San Antonio, Texas, September 23-25, 1971. Address inquiries to: C. William Hall, M.D., Scientific Sessions Chairman, AHA, Texas Affiliate, P.O. Box 9928, Austin, Texas, 78757.

ACP Courses

The American College of Physicians will present *The Physiological Basis of Endocrine and Metabolic Diseases,* September 20-24, 1971 at Duke University Medical Center, Durham, N. C. and *Rheumatic Diseases — Pathology, Immunology, Diagnosis and Treatment,* October 18-22, 1971 at Francis A. Countway Library Auditorium, Boston, Mass. Write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104.

Preventive Medicine

The American College of Preventive Medicine and the Association of Teachers of Preventive Medicine will sponsor a joint Scientific Meeting in Minneapolis, at the Leamington Hotel, Sunday, October 10th. H. Bruce Dull, M.D., Assistant Director, Center for Disease Control, Atlanta, will speak on *The Law and Medicine: Allies or Adversaries?* For more information contact ACPM offices at 801 Old Lancaster Road, Bryn Mawr, Pa., 19010.

PG Courses

The Department of Otolaryngology of the University of Illinois at the Medical Center will conduct a postgraduate course in Laryngology and Bronchoesophagology, October 4-9, 1971. The Annual Otolaryngologic Assembly of 1971 will be held October 23-29, 1971, in the University of Illinois Hospital Eye and Ear Infirmary. Interested otolaryngologists should direct their inquiries to: Otolaryngology, P.O. Box 6998, Chicago, Ill., 60680.

Today's Hospital Problems

The Mound Park Hospital Foundation with the joint sponsorship of the College of Medicine University of South Florida announces the Fifth Annual Postgraduate Conference on *Today's Hospital Problems: An Interdisciplinary Approach,* November 10-13, 1971. For information write: Mound Park Hospital Foundation, Inc., St. Petersburg, Fla., 33701.

Pastoral Care

A two-day conference designed for both physicians and clergymen on "The Pastor's Hospital Ministry" will be held at the Wilmington Medical Center on September 28-29. Dr. Seward Hiltner, Professor of Theology and Personality, Princeton Theological Seminary, will speak at the Wednesday evening banquet on "The One Who Heals." For registration information call Mrs. Mary Money at 428-2780.

Oil Chemists Meeting

Physicians and scientists interested in the use of fats and oils in food and nutrition as well as in industrial processing will gather at Chalfonte-Haddon Hall in Atlantic City, N. J., October 3-6, 1971 for the National Fall Meeting of the American Oil Chemists' Society. For advance registration, contact Donald S. Fritz, Woburn Chemical Corporation, 1200 Harrison Ave., Harrison, N. J., 07029, telephone (201) 991-3300.

Physicians & Schools Conference

The Thirteenth National Conference on Physicians & Schools will be held September 30-October 2, 1971, at the LaSalle Hotel, Chicago, Illinois. Write for further information to The Department of Health Education, AMA, 535 N. Dearborn Street, Chicago, Ill., 60610.

AAP Annual Meeting

The American Academy of Pediatrics will hold its 40th annual meeting in Chicago, October 16-21, featuring a versatile program including seven symposia, 17 round tables, 18 seminars, 12 motion picture films and several special sessions including a symposium on children's television programming.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

PEDIATRICIAN: At present Chief of Pediatrics at an Air Force Base. Available September 1972.

GENERAL PRACTITIONER: Also interested in public health opportunities. Graduate Canadian medical school.

OBSTETRICIAN-GYNECOLOGIST: Completing residency at Pennsylvania Hospital. Available July 1972. Interested in northern Delaware.

SURGEON, CARDIO-THORACIC AND VASCULAR: Board-certified. Currently in Navy. Available March 1972. Prefers associate set-up or group practice.

OPHTHALMOLOGIST: Interested in relocating in Delaware from Great Lakes area.

UROLOGIST: Board-eligible. Residencies at University of Virginia Hospital. Available fall 1971.

GENERAL PRACTITIONER: Interested in area with doctor shortage. Irish medical graduate. Available early 1972.

OPHTHALMOLOGIST: Currently completing residency at State University of New York, Downstate Medical Center. Available July 1972.

INTERNAL MEDICINE: Johns Hopkins graduate. Interested in Delaware opportunities.

R.N.: Part time. Evening or week-end in the Newark area. Call 652-6512.

⁂

Two Old Buckets
R. Douglas Sanders, M.D.

Physicians are invited to send the Journal photographs of their art work: brush, camera, pen, chisel.

The Physician and The Pharmacist

A monthly feature of the Delaware Pharmaceutical Society

L-DOPA — Long-Term Effects

Various untoward effects of L-dopa became evident during a 15-month period in which the drug was employed in 60 severely afflicted patients with Parkinson's disease (postencephalitic and idiopathic). Symptomatic improvement occurred in the majority of patients treated with L-dopa but was of limited duration and followed in all cases by adverse effects which were often progressive, sometimes serious, and occasionally dangerous. The restoration of mobility in severely afflicted patients created problems stemming from the patient's great urge to move about even though postural reflexes remained unimproved. Many patients suffered falls and five sustained fractures. Muscle wasting and osteoporosis resulting from prolonged immobility were no doubt contributing factors. A number of patients experienced psychiatric and neurological complications which in some cases persisted for months following withdrawal of the drug. The most serious adverse effect observed by the authors was the occurrence of "akinetic episodes" in approximately 30% of patients. In five patients the akinetic states were associated with stupor, the latter being the indirect cause of death in one patient. Withdrawal symptoms were observed in certain instances. When L-dopa was withdrawn from patients in whom severe hyperkinetic or akinetic symptoms had already developed, a disabling syndrome resulted. Typically, such patients showed gross tremor of the body, rigidity or hypotonia, akinesia, subjective weakness, restlessness, depression, somnolence, and even stupor. Another disturbing feature of L-dopa therapy was accelerated onset of adverse effects following readministration of the drug. It is not known how long patients must stay off the drug before it may be given again without precipitating such reactions. Finally, there may be emotional reactions to the therapeutic situation, due primarily to the patient's over-enthusiasm during the responive period. The authors conclude with these words of caution:

> "It is evident that the administration of levodopa may generate problems of unusual complexities. Our concern is the occurrence of serious and possible long-term effects — a point inadequately discussed in the literature. We therefore have reservations about the release of the drug at this time as indeed the Food and Drug Administration itself seems to entertain, since it commented in its bulletin that 'long-term safety and efficacy have not been established.' "

Sacks OW, et al: JAMA 213:2270, 1970.

L-DOPA — MAO Inhibitors

It has been suggested that MAO inhibitors* potentiate the pressor effect of L-dopa. The following experiment was conducted to assess the degree of risk of such combined therapy. A patient with idiopathic Parkinson's disease previously treated with benzhexol and imipramine was hospitalized and phenelzine substituted for imipramine. Ten days later the patient was given 50 mg L-dopa orally. Within 90 minutes the patient's systolic blood pressure reached 185 mmMg (pretreatment level, 135 mmHg). The reaction was controlled by the intravenous administration of phentolamine. A single dose of 25 mg L-dopa given the following day had no effect on the blood pressure. MAO inhibitors should be withdrawn from all patients with Parkinson's disease at least *one month* before L-dopa is given. "If patients on L-dopa require antidepressives we see either imipramine or amitriptyline (tricylic antidepressants**), which seem to be safe."

Hunter KR, et al: Brit Med J 3:338, 1970.

*Monoamine oxidase inhibitors: eg, iproniazid (*Marsilid*-Roche), isocarboxazid (*Marplan*-Roche), mebanazine, nialamide (*Niamid*-Pfizer), pargyline (*Eutonyl*-Abbott), *phenelzine* (*Nardil*-Warner-Chilcott), pheniprazine, phenoxypropazine, pivhydrazine, tranlcypromine (*Parnate*-SKF), *furazolidine* (*Furoxone*-Eaton).

**Tricylic antidepressants: eg, amitriptyline (*Elavil*-MSD), desipramine (*Horpramine*-Lakeside or *Pertrotraine*-Geigy), imipramine (*Tofranil*-Geigy), iprindole, nortriptyline (*Aventyl*-Lilly), opipramol, protriptyine (*Vivactyl*-MSD), trimipramine.

THE FORUM

Environment And Health

RABIES

Louella Metzger

"Dog-bite season — otherwise called spring and summer by those less involved in this problem."

Rabies is indeed a problem which still challenges our most sophisticated virologic and immunologic techniques and public health practice. In spite of the excitement and hope generated by the first known recovery of a person suffering true rabies infection, we know that our public officials, veterinarians, physicians, and public health personnel must continue to be actively involved in rabies control programs.

Approximately 500,000 people in the United States are bitten by animals each year; 30,000 of these people undergo rabies prophylaxis. Delaware is fortunate to have had no rabid animal bites since 1968, *but* in 1970 there were 1,392 reported animal bites. Since the last epizootic in the 1950's Delaware has had a strong control program, but the increase in the pet population, particularly dogs, the increase in the mobility of our people, and the increase in the possibility of importing the rabies virus to Delaware demand constant recognition of the need for an active control program.

A strong, long-range control program consists of three separate programs focused on the three hosts involved: domestic animals, wild animals, and people. Preventive measures aimed at the pet population include a pre-exposure vaccination program of at least 70% of the entire dog population. Cats should also be included in this vaccination program. Licensing and leaching laws are an important adjunct to the vaccination program, and vaccination of the pet should be a requirement for licensure. The need to make house-to-house calls to enforce these laws must be recognized. A stray animal program is an important phase of any control program and especially in epizootic areas.

Periodically epizootics of rabies occur, usually beginning in wild animals. Bites from foxes, raccoons, skunks, and bats may well be infectious. Selective wildlife control depends on local conditions and uses the most practical methods of reducing the wildlife population. No matter how appealing, foxes, skunks, raccoons, etc. should not be adopted as pets. Bats have caused several human rabies deaths in the United States, and the rabid animal bite of 1968 in Delaware was caused by a bat.

A control program aimed at people includes pre-exposure immunization of persons in the high-risk group: veterinarians, animal handlers, and certain laboratory personnel. The postexposure prophylaxis for persons having been bitten is the responsibility of the physician. Probably the key areas in this part of a control program are public awareness and public education, not only in reference to the dangers of rabies infection but also to the prevention of all animal bites.

By reason of his unique position the physician's role in rabies prevention extends far beyond the immediate treatment. He must promote and support a strong, well-organized, well-publicized rabies control program in his community. Delaware's rabies control program can be effective and strong only with the continued cooperation of the physician and the public. The Division of Physical Health requests that all animal bites be reported immediately to the respective county health unit. In the City of Wilmington please call 656-2591; in New Castle County 994-2506; in Kent County 678-4729; in Sussex County 856-2571.

Mrs. Metzger is Public Health Educator, Division of Physical Health, City-County Health Office, Wilmington.

This page is sponsored by the Delaware Tuberculosis and Health Society.

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MEDICAL SOCIETY OF DELAWARE

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October 8 and 9, 1971

182nd ANNUAL MEETING

PROGRAM

House of Delegates

OCTOBER 8
Maple Dale Country Club
Dover, Delaware
3:00 P.M. House of Delegates
6:30 P.M. Cocktails and Dinner

Prayer Breakfast

OCTOBER 9
7:45 A.M. Holiday Inn Motel, Dover

Socio-Scientific Session

OCTOBER 9
Dover Downs
duPont Highway, Dover, Delaware

8:30 A.M. REGISTRATION — EXHIBITS
9:15 A.M. CALL TO ORDER — Rhoslyn J. Bishoff, M.D., President, Medical Society of Delaware
Welcoming Remarks — Winfried Mroz, M.D., President, Kent County Medical Society
Report of the House of Delegates — Joseph W. Abbiss, M.D., Secretary, Medical Society of Delaware
9:30 A.M. SEMINAR ON SEX EDUCATION FOR PHYSICIANS, Part I — Edward A. Tyler, M.D., Professor of Psychiatry, Indiana University School of Medicine
10:35 A.M. INTERMISSION — EXHIBITS
11:00 A.M. SEMINAR ON SEX EDUCATION FOR PHYSICIANS, Part II
12:00 BUSINESS MEETING
Election of President-Elect
12:30 P.M. LUNCH — Host, Kent County Medical Society
Fashions by Benjamins and Heaven to Eleven, Inc., Blue Hen Mall, Dover
Models — Members, Woman's Auxiliary to the Medical Society of Delaware and their children
2:00 P.M. CURRENT CHALLENGES FACING MEDICINE — Ernest B. Howard, M.D.
Executive Vice President, American Medical Association
2:40 P.M. INTERMISSION — EXHIBITS
3:00 P.M. WHAT'S NEXT? — Julian Bond, Member, Georgia House of Representatives
3:40 P.M. ADJOURNMENT

Dinner Dance

6:30 P.M. Cocktails Dover Downs, DuPont Highway, Dover
7:30 P.M. Annual Banquet
Invocation — The Reverend Robert L. McKim, The Presbyterian Church of Dover
Dancing 'til midnight—Corky Kling's Dixieland Band

SCIENTIFIC EXHIBITORS

No. 1—"Hepatic Receptor Protein Research" — Carl I. Glassman, M.D. and Shmuel Agrov, M.D.

The exhibit shows preliminary findings in isolation and quantitation of newly discovered hepatic cytoplasmic receptor proteins Y and Z.

No. 2—"Does the Urinalysis Detect Bacteriuria?"

J. L. Clark, Ph.D., B. Z. Paulshock, M.D., and R. Rocco, B.S.

The purpose of this exhibit is to illustrate the importance of screening patients for urinary tract infection by culture rather than urinalysis. Sixteen per cent of diabetic and twelve per cent of non-diabetic patients had greater than 10^5 pathogenic organisms per ml. Only half of the patients with positive cultures had proteinuria or pyuria, while 25% of those with a negative culture had proteinuria and 8% had pyuria. The conclusion is that the only reliable means of diagnosing a urinary tract infection is by culture.

No. 3—"Antibiotic Selection in the Seriously Ill Patient"

William J. Holloway, M.D., Russell Labowitz, M.D., and William A. Taylor, M.D.

Factors to be considered in selection of the antibiotic or antibiotics for the seriously ill patient are presented, along with the results of a clinical study of the efficacy of carbenicillin.

No. 4—"Retinal Lesions in Subacute Sclerosing Panencephalitis"
Dewey A. Nelson, M.D., Alvin Weiner, M.D., Myron Yanoff, M.D. and Jose dePeralta, M.D.
Two teen-age girls died from a progressive neurological disease diagnosed at autopsy as subacute sclerosing panencephalitis. The presenting symptom in one patient was loss of vision; in the other, akinetic seizures. One patient lost central vision in one eye, then in the other. Ophthalmoscopic examination revealed a macular lesion consisting of edema, pigmentation, and hole formation. The other patient did not have visual complaints during the illness, and retinal lesions were not demonstrated during life, except for some pallor of the optic discs. At autopsy, however, lesions of the retinas were noted. Both patients showed numerous inclusion bodies in the brain and neuronal cells of the retinas. To our knowledge, inclusion bodies previously have not been demonstrated in retinal lesions of patients with this disease.

No. 5—"Management of the Multiple Sclerosis Patient"— George J. Boines, M.D.
Statistics and case histories of 650 Multiple Sclerosis patients treated since 1958 from 23 states and Canada will be presented.

No. 6—Delaware Institute of Medical Education and Research
A 3-paneled display including photographs and text outlining and describing the Delaware Institute for Medical Education and Research and the activities conducted by the University of Delaware, the Wilmington Medical Center and the Jefferson Medical College of Thomas Jefferson University under DIMER.

No. 7—"New Technique in Scalp Opening and Closing"— Pierre L. LeRoy, M.D., and New Research and Development Laboratories, Inc. of Wilmington, Delaware
New biomedical engineering techniques have helped to iimprove surgical procedures. The exhibit demonstrates three such devices. The first, designated as Scalp Clamp, allows for a rapid application of a single disposable hemostatic device. The second is a continuation of this concept employing a single continuous type disposable clamp. The third, the Rapid Closure Clamp, allows for a rapid approximation of tissue. These devices can be used by paramedical assistants.

No. 8—"Laparoscopy" — John M. Levinson, M.D.
The new and expanding uses of laparoscopy for diagnosis as well as intra-abdominal surgery. The exhibit will have the actual equipment used, as well as color photographs taken through the equipment to show how bilateral partial salpingectomy is accomplished with the hospital stay of under twenty-four hours. The advantages and possible uses of this for diagnostic purposes will be explained. The American Cystoscope Makers, Inc. will detail technical information. A personal series of approximately seventy-five cases will be analyzed.

No. 9—Improved Instrumentation for Tracheostomy Care — R. Douglas Sanders, M.D.
Stenosis and ulceration are frequently seen following prolonged resuscitation through tracheostomata. The trauma which initiates such adverse results is minimized by using soft occluding cuffs which require very little inflating pressure. A method of testing elastomers for potential irritating quality is shown. A new experimental ventilator using the injection principle is demonstrated.

No. 10—"Maintaining Function of the Proximal Interphalangeal Joint of the Finger"
Joseph A. Arminio, M.D.
A slide demonstration of the anatomy of the normal interphalangeal joints and an exposition of the preoperative and postoperative repair of the damaged joints to regain function.

No. 11—"Gynny" Pelvic Teaching Model — Ortho Pharmaceutical Corporation
The model gives physicians versatility in designing learning experiences. The set of interchangeable specimens of internal organs provided with each model allows the physician to reprogram the model easily to simulate a variety of normal and abnormal physical findings for teaching: the techniques of pelvic examination, clinical problems for physician study, evaluation, family planning methodology, and nursing procedures.

No. 12—"Chromosome Studies — Who Needs Them?"
Antonio Narveaz, M.D. and Henry R. Cowell, M.D.
This exhibit will outline those conditions in which chromosome studies are of value to the orthopaedist. It will also review those orthopaedic conditions which are inherited in a mendelian or multifactorial fashion and in which studies are not indicated.

No. 13—"Bicentennial Committee" — Allen C. Wooden, M.D., Chairman
The presentation will consist of photographs, books, and other artifacts illustrating the state of medicine in the colonies before and during the American Revolutionary War period. Especially stressed will be the work of Dr. James Tilton, first president of the Medical Society of Delaware.

TECHNICAL EXHIBITORS

No. 14—HOMEMAKERS-Upjohn
Homemakers is a national organization, with offices across the country, that provides temporary part-time (or full-time) help to people who need visiting home managers, homemakers and live-in aides. Homemakers also employs registered licensed practical nurses and nurses aides for hospital staff relief and private-duty care.

No. 15—PRO Services, Inc.
Distributor: Modern America Securities Corporation
PRO Services, Inc. is a full service financial organization specializing in tax-sheltered retirement programs; it is administrator for professional society Keogh programs and plans for professional corporations. PRO handles over 80 mutual funds (including no-load PRO Fund), and through Cannon & Company, a brokerage subsidiary, manages general securities accounts.

No. 17—Truitt Printing Company
We are pleased to print the *Delaware Medical Journal* each month.

No. 19—Eli Lilly and Company
You are cordially invited to stop by our booth where Eli Lilly and Company representatives will be glad to answer your questions regarding Keflex®, Keflin®, Loridine®, and Kafocin®.

No. 20—Blue Cross and Blue Shield of Delaware, Inc.
You are cordially invited to visit with our representatives who will gladly answer any questions you may have.

No. 21—Bertholon-Rowland Agencies
The sponsored Disability Income Plan of the Medical Society of Delaware has been available to members for 18 years. Representatives of Bertholon-Rowland Agencies welcome this opportunity to review the important features of the group program and its value to you — as an individual or a professional association.

No. 22—Sandoz Pharmaceuticals
Sandoz Pharmaceuticals cordially invite you to visit our display at Booth #22, where we are featuring MELLARIL®, HYDERGINE®, SERENTIL®, CAFERGOT P-B®, FIORINAL®, and BELLERGAL®.

No. 23—Scientific Publications
Our close contact with the medical profession enables us to serve you promptly and efficiently in this dedicated field. We will fill all of your needs from stock because we specialize in service to schools of nursing, hospitals, institutions, and libraries. We carry all publishers' books in the medical profession. Non-medical books are also available through our trade department for your convenience.

No. 24—Bristol Laboratories
You are cordially invited to visit our exhibit reflecting Bristol's leadership and enduring commitment to the manufacture of life-saving antibiotics. For your consideration, the following Bristol antibiotics are featured: Versapen® (hetacillin), Tetrex® (tetracycline phosphate complex), and Kantrex® (kanamycin sulfate). Our representatives welcome the opportunity to answer your inquiries.

No. 25—Merck Sharp & Dohme
The Merck Sharp & Dohme exhibit has been designed to offer a contribution to your therapeutic armamentarium. Technically trained personnel are available to discuss the scope and variety of services offered to physicians.

No. 26—Wyeth Laboratories
The Wyeth exhibit will feature the low dose oral contraceptive, OVRAL®, and SERAX®, our well established anti-anxiety agent. Mr. Bob Dulick, Mr. Jerry Guerin, and Mr. Dave Cooper will be in attendance and happy to be of service to you.

No. 27—Ayerst Laboratories
Our representatives look forward to a visit with you, and for the opportunity to discuss the Ayerst products and services of interest to you.

No. 28—Abbott Laboratories
Abbott Laboratories invite you to stop by their exhibit where their representatives will be available to answer any questions you may have on their products, ERYTHROCIN®, ABBOTT HEMATINICS (complete line), and SYLLAMALT®.

No. 29—Cedar Tree Press
Mr. N. L. Cerchio III will be available to assist you in planning for your printing needs. Samples of professional stationery and administrative aids will be displayed.

No. 30—Coca-Cola USA
Ice cold Coca-Cola served through the courtesy and cooperation of the Delaware Coca-Cola Bottling Company and Coca-Cola USA.

No. 31—Stuart Pharmaceuticals/Division of ATLAS CHEMICAL INDUSTRIES, INC.
A cordial invitation is extended to all members and guests attending this meeting to visit the Stuart Pharmaceuticals booth. Trained representatives will be in attendance to answer your questions on our products: MYLANTA®, CHEWABLE SORBITRATE®, SORBITRATE® Sublingual and Oral, KINESED®, STUARTNATAL™ 1+1, and others.

No. 32—Prudential Insurance Company of America
You are cordially invited to visit with Stan Collender and Jack Conners, C.L.U. of the Delaware Valley Agency. We will have available the latest information on professional corporations, estate conservation, and disability pay plans.

No. 33—Burroughs-Wellcome Company
The Burroughs-Wellcome Company exhibit will deal primarily with products used in prevention of urinary tract infections associated with use of the indwelling catheter. One product is Neosporin G. U. Irrigant for continuous irrigation with the indwelling catheter; the other, Lubasporin antibacterial urethra lubricant to be used preceding catheterizations and sterile pelvic procedures.

No. 34—Hilyard's

No. 35 Delaware League for Planned Parenthood

No. 39—Woman's Auxiliary to the Medical Society of Delaware
The projects and accomplishments of the Woman's Auxiliary will be graphically illustrated.

No. 40—College of Nursing, University of Delaware
Our exhibit will show College of Nursing students in action, demonstrating activities in the different clinical areas, and giving general information about the College of Nursing of the University of Delaware.

No. 41—Division of Physical Health, Department of Health and Social Services, State of Delaware
The Division of Physical Health exhibit will focus on the importance of nutrition to health, and the nutrition services offered by the Division. Using lighted transparencies featuring the basic four food groups, the exhibit will also provide nutrition service literature.

No. 42—Kent County Business Machines, Inc.

No. 43—Delaware State College Pre-Medical Society—"Proteins and Enzymes—Their Structure and Action"

This exhibit is designed to show (1) the physical dimensions of proteins and their constituent amino acids. (2) the arrangement of amino acids within a protein molecule, (3) the enzme-catalyzed breakdown of proteins, and (4) protein separation by ion-exchange chromatography. Demonstrations showing the enzyme-catalyzed breakdown of proteins and the separation of proteins by ion-exchange chromatography will be conducted by students.

No. 47—SAMA-Eaton Medical Art Salon
Winning entries in the 13th Annual SAMA-Eaton Medical Art Award Competition will be displayed.

No. 50—American Cancer Society, Delaware Division, Inc.
An anatomical model will be used to demonstrate the techniques of proctosigmoidoscopy and to visualize and recognize disease entities. Peter V. Martin, M.D., Wilmington proctologist, will be present to demonstrate the techniques and to answer questions.

No. 54—Peripheral Vascular Unit
A table-top self-testing unit on Diagnosis and Treatment of Peripheral Vascular Disease will be available, courtesy the Delaware Heart Association. Consisting of four panels illustrating medical case histories, the unit is intended to test diagnostic ability through pertinent illustrated data.

No. 55—Eckerd's Drug Stores

No. 56—Scholastic Systems, Inc.
Scholastic Systems, Inc., a division of General Educational Services, is involved in the field of multi-media educational products; areas of equipment and accompanying software cover audio-visual educational aids, cassette recordings, rapid reading programs, remedial reading, programmed mathematics, science and language studies.

No. 57—Roche Laboratories
You are cordially invited to visit the Roche display. The Roche representative will gladly answer any questions you may have on any products in the Roche line. Featured will be Librium® and Valium®.

No. 58—Mutual Benefit Life Insurance Company
Walter B. Suskind, C.L.U., Agency of Mutual Benefit Life Insurance Company, presents "Financial Planning for the Physician". There will be special emphasis this year on "Financial Profiles", objective computer analysis of the physician's financial goals and the characteristics of various investment media best suited for accomplishing these goals.

No. 59—Gray Audograph, Inc. — Paul J. Collins
DICTATION SYSTEMS — Featuring The Executive Thought Trap, phone in from any phone in the world, as well as in your office. Standard Cassette Portables and Transcribers. Magnetic Belt Dictators, compatible with most present hospital equipment in Delaware. Local sales and service.

No. 60—Mead Johnson Laboratories
Featured at this year's display are two of the latest additions to the Mead Johnson product line — VASODILAN® syrup and SUSTACAL® — nutritionally complete food.

No. 61—Pfizer Laboratories Division
Mr. John Lomax, Pfizer representative from Wilmington, will be available and looking forward to discussing products and services provided by Pfizer Laboratories.

No. 62—Libby Surgical Supply Company
Instruments, diagnostic and treatment supplies. We wish the members of the Medical Society of Delaware a most successful meeting.

No. 66—Warner-Chilcott Laboratories
Your Warner-Chilcott representatives cordially invite the members of the Medical Society of Delaware to see and discuss what's new at Warner-Chilcott, Booth #66.

No. 67—Smith, Miller & Patch, Inc.
Smith, Miller & Patch, Inc., New Brunswick, New Jersey will feature a new non-barbiturate hypnotic, SOMNAFAC and SOMNAFAC FOURTE; DECONAMINE, a potent oral antihistamine and decongestant in three dosage forms; PYOCIDIN-HC OTIC SOLUTION; VASOCIDIN Ophthalmic-Otic Solution; our hematinics, VITRON-C and VITRON-C PLUS; and our specialty bowel regulator, KONDREMUL.

No. 71—Abbey Surgical Company, Inc.

No. 72—J. A. Montgomery, Inc.
Members of the Medical Society of Delaware are cordially invited to seek the latest information on any type of insurance, estate planning, or tax savings. J. A. Montgomery professional specialists will be on hand.

No. 73—G. D. Searle & Co.
You are cordially invited to visit the Searle booth where our representatives will be happy to answer any questions regarding Searle Products of Research. Featured will be information on DEMULEN®, ENOVID®, ALDACTAZIDE®, FLAGYL®, LOMOTIL®, PRO-BANTHINE®, and other drugs of interest.

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THE ROLE OF THE SURGEON IN MEDICAL EDUCATION

• The author asks: What is a surgeon, what does he need to know, and how does he acquire this knowledge?

Gordon F. Schwartz, M.D.

Certainly it must be an innovation for a chapter meeting of the American College of Surgeons to have as its speaker a brand new initiate into the College. It is with a certain amount of trepidation and humility that I stand before this group of my elders rather than peers, and attempt to foist upon it my own impressions of the role of surgeons in undergraduate and graduate medical education. Let me hasten to assure you that although I am but eleven years ahead of this year's graduating group of medical students and have finished my own surgical training only within the past few years, I am considered by the current crop of medical students to be a well-entrenched member of the establishment.

Medical education and the modern practice of medicine face considerably different problems from those which confronted Abraham Flexner sixty years ago. No longer does medicine suffer from a lack of a solid scientific base, but instead science has grown so explosively that medical practice has been unable to keep pace. The informed public knows of the dramatic developments in medical knowledge and advances in surgical skill, and has expressed its grateful appreciation by spending more money on medical services and by supporting research that is expected to lead to still greater medical achievements. This same informed public, however, knows that a wide gap may exist between the best that medicine can presently offer and the services actually available to many patients.

Editorial comments appear on page 254

In discussing a topic so broad as surgical education, it would appear that certain fundamental questions must be raised: What is a surgeon, what does he need to know, and how does he acquire this knowledge? A surgeon has been defined as one who seeks to help the sick, the injured, or the deformed by judicious manipulation of the patient's tissues and organs. Upon this foundation is then built the application of scientific knowledge, technical skills, and principles of judgment. These are transmitted from one to another by teaching and by training.

Dr. Schwartz, F.A.C.S., is Associate Professor of Surgery, Jefferson Medical College; and Director, Surgical Training Program, Thomas Jefferson University Hospital.

This paper was originally presented at the Annual Meeting of the American College of Surgeons, Delaware Chapter, January 12, 1971, Wilmington, Delaware.

Less than 100 years ago, surgery existed as an apprenticed craft. Apprentices were dependent upon their masters for technical training and guidance. There was no licensure or control, and boundless quackery existed. By trial and error the conscientious and skillful continued to learn after their apprenticeship, first on helpless paupers in the almshouses, then upon their own paying patients.

After Dr. Flexner's report in 1910, when medical school education became relatively standardized, a few individuals followed their hospital internship with a period as "house surgeon." The residency system of training begun under Halsted became the established method of preparing medical school graduates for surgical careers, and in the late 1930's, the residency system was firmly established as the dominant system of contemporary surgical training. One of the circumstances which has encouraged this residency system has been the presence of the charity ward patient. Now that new laws have all but abolished this circumstance, we must ask ourselves how we will train the surgeons of the future. Must this social gain for patients result in our turning back the training of surgeons by the restoration of the apprentice systems?

Let us not pretend that we have established ideal surgical care for all in this country, but we do believe that by establishing high standards of training for more and more surgeons, we are moving in that direction. Can we continue to move in that direction? Certainly the residency system has produced more well-trained men in a shorter time than any other method. If better health care is to be extended to those not now receiving it, we must preserve this system without compromising principles or lowering the standards.

Medical Education and Surgical Training a Broad Continuum

We must look at medical education and surgical training as a broad continuum. The successful completion of medical school used to mark the end of formal medical education, but now, certainly in surgery and the surgical subspecialties, it comes less than half way along the road. The typical young surgeon now spends four to seven years more as a resident and perhaps a year or two in military or other practice before the specialty boards consider his medical education to be complete. If this total period of time is proper for surgical education, then these years should constitute an aggressive and articulated continuum.

From the comparative uniformity of medical schools to the great diversity of internship programs is a big jump. Undergraduate medical education is concentrated in approximately 100 schools of medicine, but internships are offered in more than 800 approved hospitals. The internship no longer provides the student's first practical experience with problems of diagnosis and treatment; undergraduate clinical clerkships now serve that function. Internships no longer provide the final educational experience preceding independent practice; a residency is now considered necessary to fulfill that purpose. Presently, approximately 1400 American hospitals offer residencies with over 40,000 positions being available. At the time of Flexner, the internship marked the completion of preparation for medical practice; the residency was a special period of added clinical education for a few promising young physicians. Presently, more than 75% of medical school graduates go on to become certified in various medical specialties. The Citizens Commission on Graduate Medical Education of the American Medical Association* recommended in 1966 that internships, as a separate and distinct portion of medical education, be abandoned, and that internship and residency years be combined into a single period of graduate medical education called the residency and planned as a uniform whole.

Graduation from medical school is to be recognized as the end of general medical education, and specialized training thus begins with the start of graduate medical education. The Millis Commission recommended that programs of graduate medical education be approved only if they cover the entire span, from first year of graduate education through the completion of residency. The recommendations of the Millis Commission have been, in principle, adopted by the American Medical Association, and it behooves us as surgeons to examine both undergraduate and graduate surgical education in the light of these recommendations.

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*Also known as the Millis Commission.

Traditional Methods of Teaching Changing

With the dramatic evolution of electronic communications, audio-visual, and information data processing systems, and with technical apparatus of incredible sophistication, the traditional lecture, laboratory, and textbook methods of teaching may prove to be antiquated, time-consuming, and wasteful of both student and faculty energy. The standard basic science textbooks for beginning students will probably be revised to reflect multidisciplinary subject matter and will include correlated clinical concepts. However, for an effective, capable practitioner, there are certain skills which can only be learned by repetition. These are interviewing techniques and methods of history taking, physical and psychosocial examinations, the common laboratory tests of blood, stool and urine, and the principles, logics, and methods of differential diagnosis. Despite the changes in medical school curricula necessitated by the revolutionary dynamics of science and technology, the student who expects to practice clinical medicine must still be exposed in depth to internal medicine, pediatrics, obstetrics and gynecology, and general surgery. It has been suggested that perhaps these four departments should assume responsibility for the supervision and content of courses studied as basic science disciplines, with the faculty of the basic science departments associating themselves with the clinical departments for this purpose. For instance, gross and microscopic anatomy and surgical pathology in relation to medical practice might be assigned to the department of surgery; physiology, pharmacology, biochemistry, immunology, and general pathology to the departments of internal medicine and pediatrics; anatomy and physiology of human reproduction and the pathology of reproductive organs to the departments of obstetrics and gynecology, and perhaps urology. By commencing clinical studies at the beginning of the first year and eliminating specialized study of basic sciences except as correlated with clinical medicine, it can be anticipated that by the time a student reaches his fourth year he will be able to function as a full fledged intern, and not as a clinical clerk. In this way a student upon graduation might qualify as a first year resident in the specialty of his choice.

We must also look at the responsibilities of the department of surgery in its continuing education even within the premedical area. Certainly more and more youngsters are working in research laboratories in medical schools. This should be encouraged by departments of surgery even for high school students.

The basic core course of surgery which we offer at Jefferson is in the third year, but in the fourth year we should be offering more surgical electives with just as much attention paid to their organization as to the core surgical course. There must also be research and training activities in surgery for the medical student in the summers to supplement elective offerings.

One other problem which we as surgeons are capable of solving is that of the general image of the surgeon as an intellectual leader and scholar. We must have more faculty available to round with students at prime times. This is extremely difficult for surgeons who are accustomed to operating in the early morning. Late in the afternoon when everyone is tired is not the best time to compete with our colleagues in internal medicine and pediatrics. They do not have the problems of manning the operating room but instead can concentrate on teaching with their prime teachers in the prime time.

The Use of the Operating Room

Let us next consider the use of the operating room not just for the medical student but also for the intern. I'm not sure that the intern or the medical student has to be present from the beginning to the end of an operation. Perhaps the medical student should come in only to see the pertinent pathology. Also, we must tailor clinical electives in the fourth year to fit new graduate educational programs. For instance, if a student wants to be a urologist, he might spend elective time in renal physiology, not by crowding his elective year with surgical courses.

It is impossible to expect students to learn everything about health care. The total amount of information is not the distinguishing characteristic of the good physician; it is the competence with which he solves the problems he encounters. Certainly he requires information, but he rarely requires immediate recall. Thus, it is the process by which this is done that becomes important, not simply the information which may be recalled at the patient's bedside. We must therefore emphasize process rather than product in education. In each of our encounters with students, I think we must ask the question: Does this encounter increase the student's skill as an independent learner, or is it merely a mechanism for displaying our own? Surgical house staffs spend most of their time in problem-oriented tasks, practicing skills that relate to their anticipated lifetime professional activity. The house officer is assessed by how well he collects information and how well he uses his resources to make good judgments.

All of the students with whom we are dealing are bright, young people from the top 5% in the country. We must offer our students exercises in problem solving and in decision making. Of course, the first step must be the identification of the problem. Thus, the student must inquire before he can acquire.

The Surgical Core

The responsibilities of our department of surgery are to see that each medical student leaves Jefferson with a basic minimum of surgical knowledge, that which we have come to call, for lack of a better term, the "core" of surgery. Because it is impossible for the few of us who are geographically full time at Thomas Jefferson University Hospital to accept the responsibility for the surgical education of 200 students a year, plus the necessary electives and other clerkships, we must rely heavily upon our affiliated institutions to accept approximately half of the number of each class and to be responsible for their entire required student surgical education.

We, at Jefferson, certainly rely quite heavily on practicing clinical surgeons in the community to teach our students the basic principles of surgery. I think this is how it should be. After all, who is more capable of inspiring a student to seek surgical knowledge than the practicing surgeon? It is important to us that our students very quickly correct any misconceptions they may have had about there being two kinds of surgery, that practiced in the university hospital, and that practiced in the community. I think our Jefferson students are fortunate to have so many high quality affiliated hospitals through whose services they may rotate to prove that there is but one acceptable standard of medical care.

Certainly, there must be some organization behind our multiple affiliations, and our department has worked out a core curriculum with which each student should be acquainted by the time he finishes his twelve-week surgical block. We have left the implementation of the curriculum to the surgical services of our affiliated hospitals so that each can maintain its own identity. Our students, by comparing notes, are then made aware that this same objective may be accomplished through a variety of avenues.

I would be remiss in not mentioning that I sincerely believe that the student does have an obligation to his school. There is no question that our students have every right, and indeed it is their responsibility, to tell us, their teachers, how well they have been taught. In a small sense, we obtain that information by finding out where our students rank in comparison with students from other schools in taking the National Board examinations. I believe that students are not necessarily capable of choosing what they are to be taught. I believe that one must go through the educational process before one can accurately comment upon its content.

If my prior premises are true, the rotating internship is an anachronism, and the entire sequence of postgraduate years in surgery must be considered as a unit. In surgery, unlike internal medicine, the movement of a trainee from one institution to another with fragmentation of his career development tends to interfere with his progress. We have adopted the policy of a broad basic surgical education, the "core curriculum" of graduate surgical education. At Jefferson, this involves a two-year program, which we presently call the surgical internship, and the first year of surgical residency. This program has been designed to provide the basic foundation of surgical knowledge and pre- and post-operative care upon which to base a training program in the surgical subspecialties or further training in general surgery. The first year, which today we call the surgical internship, provides a year of training in general surgery and its subdivisions of thoracic, cardiac, and plastic surgery, plus an additional experience in the department of medicine, and the emergency ward. During this year, our trainees are expected to acquire the good basic surgical habits which will accompany them throughout their careers. The second year of this core surgical program is one which we think is unique. This year, corresponding to the first year of surgical residency, is individually planned for the trainee depending upon his future plans.

General Surgery or Surgical Subspecialty?

In general, there are two basic programs, one for the men who are leaving general surgery after the second year to continue in surgical subspecialties, and a second program for those men intending to stay in general surgery. Each of the trainees receives experience in anesthesiology, but it is at this point that the men intending to stay in general surgery receive their subspecialty experience. We think it extremely important for each of the men in general surgery to obtain experience in gynecology, urology, fractures, etc., and rotations are scheduled through each of these disciplines. We prefer to do this at the resident level rather than during the previous internship year because these subspecialty areas are essentially resident services, and our people when assigned as residents are more likely to be participants than observers. For the men heading for surgical subspecialties, this second core year is again primarily spent in receiving general surgical experience, including oncologic, pediatric, thoracic, cardiac and plastic surgery.

These two programs have evolved because we have felt that it is not as important for the individual destined for ENT to spend two months on the gynecology service as it is for him to gain additional experience in the care of extremely sick general surgical patients. Similarly, why should the future orthopedic surgeon spend two months of his general surgical residency on the orthopedic service when he will be spending the rest of his career in that discipline? We also feel that it is extremely important to make a surgical training program flexible to allow for individual interests.

At the end of these two years of core surgical training, we hope that our general surgical residents are superbly prepared for their additional three years of training. Similarly, we hope that the residents whom we then turn over to the surgical subspecialties are better grounded in the surgical fundamentals than ever before. The introduction of additional elective opportunities into the residency program is also appealing. Pathology is an example of one such experience which has been incorporated for a long period of time. New departures may include possibilities such as data processing and computer methods, or instruction in the design and operation of biomechanical apparatus.

In surgery, the teaching ward environment has carried with it the important connotation of increasing responsibility of the residents for the technical procedures of surgery. However, as the regulations for the application of the Medicare law are now formulated, surgical residents still in training are specifically excluded from being the responsible physicians. Residents may certainly perform operations without staff supervision if no fee under "Part B" is collected. But the tendency of the regulations is to draw a strict line in teaching hospitals between the fully trained surgeon and anyone in training status. The same trainee might have entered independent practice after internship, where he could perfectly well be performing the same operation as the responsible surgeon, without training or supervision. We must direct ourselves to answering several questions with regard to graduate surgical education in the light of recent and forthcoming social legislation which all but does away with the indigent patient and the charity ward.

1. Are private patients to be utilized in surgical training programs?

2. Does the presence of an attending surgeon in the operating room detract from the resident's experience in the operating room?

3. What solutions are available to insure the continuation of resident training programs under the existing social legislation?

To answer the first question, I think that the consensus is certainly that private patients must be used in graduate training programs; the question is "How?" Many of the senior surgeons in this country, especially those who have been raised in Halstedian residency programs, hold that the resident should operate independently with immediate recourse to consultation before he finds himself on his own without access to immediate assistance. But are we not producing better trained surgeons, instead of merely safe surgeons, by continuing to scrub occasionally with our senior residents on "their" cases to show them the nuances of surgery and the surgical sleight of hand which may make them better technicians? During the course of his last year of training the resident will develop his own technique which may be a compilation of all the things he likes best of his various teachers' techniques. We have tried to encourage the feeling that it is the concerned and dedicated resident who insists upon having a more experienced individual help him with even a small part of a procedure.

The Role of the Resident

What is the role of the resident in the care of the private patient, and what degree of responsibility can be given to the resident without the spectre of ghost surgery being raised? Those of us who were reared in a time when there was an abundance of ward teaching material in the university hospitals can still remember many occasions when an attending surgeon would have a resident begin a private case or close the abdomen without the attending surgeon even present in the room. It is my contention that such a surgeon is more culpable than the attending surgeon who is present in the operating room from the time the patient is put to sleep until the time the patient leaves for the recovery room but helps the resident perform a majority of the procedure, or indeed, acts as the first assistant for the entire procedure. Which of these, if either, is more likely to be construed as absentee surgery? If our definition of surgeon is the individual who merely holds the knife in his hand, then I think that we are merely technicians called in by our medical confreres after the fact. On the other hand, to me "surgeon" embraces the philosophy of entirely caring for the surgical patient and also doing the procedure which may be necessary. The surgeon is the individual who decides what to do and when to do it, and this is perhaps as important as exactly how it is done.

The informed public knows full well that surgery is a team effort, and certainly, in general surgery, there are very few one-man operations of any consequence. Any sophisticated patient is aware that there are physicians-in-training, and that some of these physicians will be scrubbed in the operating room during the procedure to be performed. But what should the patient be told? No surgeon necessarily provides his patient with a long, drawn-out description of the planned technical procedure. The only technical principle which the patient needs to know is that the essence of modern surgery is a smooth working team, each member of the team carrying certain responsibilities delegated by the surgeon in charge. We have found that the team idea is attractive to the patient. I usually tell patients that the operation will be performed by a team of individuals, each with his own responsibility. I am the captain of the team and will be in charge of seeing that he gets the very best of care. So far, this concept has not been challenged. In fact, the patients seem to welcome it.

A recent study of patient care was carried out at the Columbia-Presbyterian Medical Center, N.Y.C., where a specific service has been created for this purpose and designated as the "semi-private teaching service." Each of the patients was told that the attending would be supervising his care and be present at the operation, but a significant portion of the operation might be done by the resident. It is interesting that more than 80% of the patients who were so told accepted the resident's doing the operation under attending supervision without question. Thus, we know that we can teach using private patients at the medical student and at the house staff levels, and we know that the majority of patients will accept this system without difficulty.

If what I have presented represents the feelings of the majority of the medical communities, I can see no problem in the training of surgeons in the future. We may have to educate our attending staffs. Most surgeons have the notion that nobody else can do the job quite as well as they can, and therefore they may be doing their patients a disservice by allowing the resident to do the operation when they can do it better themselves. I think that this is a notion that can be easily overcome. I think it is more demanding and more difficult, certainly a greater challenge, to help a resident with a case than to do it oneself. And most important, it's more rewarding to know that you have contributed to the education of a surgeon. There is no question that we should retain the Halstedian system, permitting the assumption of graduated responsibility, culminating in the final year with independent operating and patient care under direct or readily available supervision.

Summary

In summary, I believe we are standing at the threshold of a new era of medical education. It is our responsibility to change our own impressions and ideas about education and training to enable future generations of surgeons to reap the benefits of modern technology and surgical advances. At the same time, we must be wary lest, for the sake of innovation, we change the patterns which have produced capable practitioners. Today's medical students and house staff are better equipped, both intellectually and by clinical experience, to practice the highest caliber of medicine when they finally embark on their own. We must insure that our schools of medicine and our surgical training programs continue to turn out well trained, sensitive physicians, now and in the future, as they have in the past.

WITHERING ON DIGITALIS

November 1777

I generally order Foxglove in decoction. Three drams of the dried leaves, of water. Two spoonfuls of this medicine, given every two hours, will sooner or collected at the time of the blossoms expanding, boiled in twelve to eight ounces later excite a nausea. I considered the Foxglove thus given, as the most certain diuretic I know.

July 1785

At first I thought it necessary to bring on and continue the sickness in order to ensure the diuretic effects. But it soon appeared that the diuretic effects would often take place first, and sometimes be checked when the sickness or a purging supervened.

The direction was therefore enlarged thus: "Continue the medicine until the urine flows, or sickness or purging takes place." I found myself safe under this regulation for two or three years; but at length cases occurred in which the pulse would be retarded to an alarming degree, without any other preceding effect.

The directions therefore required an additional attention to the state of the pulse: "Let the medicine therefore be given in the doses, and at the intervals mentioned above; let it be continued until it either acts on the kidneys, the stomach, the pulse, or the bowels; let it be stopped upon the first appearance of any one of these effects. . ."

William Withering

METHADONE MAINTENANCE TREATMENT OF HEROIN ADDICTION

• The current pandemic abuse of dangerous drugs makes it imperative that all practicing physicians acquaint themselves with all available treatment modalities. Methadone represents the latest and most effective method of treating certain categories of drug afflicted patients.

Emmett P. Davis, M.D.

Definition

Methadone *(Dolophine*)* is a synthetic narcotic developed during World War II by the German pharmaceutical industry as a substitute for morphine. It has addictive qualities as do all opiates, and there are some primary methadone addicts in this country and in Europe, but it is considered to be less addicting than heroin and morphine. Methadone differs from heroin in that it is longer acting. When taken by mouth its duration of action averages more than twenty-four hours. It is also a potent analgesic with respiratory depressant properties. In larger doses it reduces gastrointestinal motility and constricts the pupils.

The average therapeutic dose of methadone in maintenance treatment programs is in the range of 40 to 120 mg daily taken as a single dose. Either tablets or liquid can be used, but in maintenance treatment liquid is preferable to avoid the patient's being able to identify the dosage or to sequester it. Recently, Eli Lilly has produced an effervescing 40 mg tablet, which, when suspended in water, dissolves quickly into an aqueous suspension which cannot be used for intravenous injection. In Baltimore, we are about to start using this form on an experimental basis.

Rationale of Methadone Maintenance Therapy

Methadone produces cross tolerance to heroin and other opiates. When a patient is stabilized by sufficient methadone, the injection of ordinary amounts of heroin will produce little or no euphoria. Dole and Nyswander call this the blocking effect of methadone. In addition, the patient's craving for opiates is reduced or abolished, according to the amount of methadone used. New patients are started on low doses, 20-40 mg daily, and gradually are built up to the therapeutic dose which averages 100 mg daily. A few patients do well on less than 40 mg daily, and an occasional patient requires more than 120 mg. The daily dose is dissolved in a sweet liquid and swallowed under the direct supervision of trained personnel. After a few months of abstinence from heroin, confirmed by urine testing, the patient may be allowed to take one or more days' supply home with him. As he continues to demonstrate reliability and responsibility, he may be allowed to take home a three to six days' supply. We feel it is important to have these privileges available to patients to give them something to look forward to in the way of less time spent at the Clinic. We adjust the number of days' dose dispensed in accordance to the patient's responsibility. If patients are guilty of infractions such as positive urine tests or missing days, this decreases their eligibility for taking several days' doses home with them.

*Eli Lilly and Company

Dr. Davis is Medical Director of Man Alive Research, Inc., a methadone treatment clinic which he organized in Baltimore, Maryland, as well as a practicing physician.

This paper was originally presented at the annual meeting of the Delaware Academy of General Practice, March 27, 1971.

Eligibility of Prospective Candidates

The individual must be addicted to an opiate and must want to stop its use. He should have had at least one trial of treatment other than methadone maintenance for his addiction and failed to remain abstinent. Psychotic addicts do not do as well as nonpsychotic addicts. Patients who become addicted because of chronic severe pain are not good candidates. Ideally, pregnant women should be detoxified early in their pregnancy and delivered while abstinent, but if this is not possible, methadone is preferable to continuing heroin addiction during pregnancy. People who are addicted to barbiturates, amphetamines or alcohol in addition to heroin usually do poorly. Dependence on drugs other than the opiates is, of course, no indication for methadone maintenance.

Selection of patients is important and should be carefully handled. Extensive psychometric testing should be available and medical and allied personnel should interview prospective candidates to document the length of their addiction and to evaluate the degree of motivation present. This is a highly skilled job best handled by a mixture of research assistants composed of ex-addicts as well as non-addicts.

Urine Testing

The entire maintenance program evolves around proper urine testing for opiates, cocaine, amphetamines, barbiturates and quinine. It is absolutely necessary that the patient be subject to properly supervised urinalysis either at random or at regular, frequent intervals. Most government guidelines suggest urine testing every forty-eight hours, but it is my opinion that all these urines need not be tested. At our clinic we collect routinely three times weekly on all patients. For the purposes of economy, some of these specimens may not necessarily run through the expensive, thin-layer chromotography. However, it is important that proper security be carried out so that no patient is aware of the manner of selection of urines to be tested.

Side Effects and Safety

When properly controlled and supervised, methadone is safe. If an addict takes more than his prescribed dosage he is, of course, subject to the hazards of narcotic overdosage and may die. Similarly, methadone supplies taken home may be improperly taken by other members of the family with impairment of their health. The side effects of methadone include drowsiness, some nausea, some sweating, and a great deal of constipation. We have found no effect on the libido of either males or females, and we have also found that tolerance eventually develops to a number of these side effects. We find that patients on methadone can function perfectly well, performing difficult mental or motor tasks. We have several patients who are iron workers who erect steel at great heights. However, patients who take large amounts of barbiturates or heroin in addition to their methadone, are subject to death from overdosage because of potentiation. Researchers in New York who have been using methadone for a number of years have failed to come up with any evidence of organ damage.

Effectiveness

Various methadone maintenance clinics report 75-85% effectiveness with an average of about 80% for all clinics in the United States. The most frequent causes of failure are alcoholism, reversion to the usage of amphetamines or barbiturates, reversion to heroin addiction, and continuing criminal activity. Some addicts do well when they lose their heroin dependence and are maintained simply on methadone. Most, however, require the support of counseling, family therapy, job retraining, or assistance in job finding. After many years of heroin hustling, an entirely new life style must be learned. In addition, the addict needs to become aware of his motives for heroin addiction.

At present, the various methadone clinics in the United States are treating about 15,000 patients daily, and it is estimated that within two years, more than 80,000 patients will be involved in some degree of treatment.

Acceptability

What are the legal aspects of methadone maintenance treatment? The FDA has issued regulations concerning methadone maintenance. Anyone wishing to prescribe methadone to heroin addicts must receive an investigational new drug (IND) application from the FDA. Certain states have legislation in connection with continuing an addict on any opiate. The Bureau of Narcotics and Dangerous Drugs is concerned about the appearance of methadone on the black market, and they require prior notification and approval of methadone maintenance programs. Safeguarding of supplies is required, and proper records must be kept as with the dispensing of any narcotic drug. Many of our enforcement agencies are in agreement with the idea of methadone maintenance, and most programs have both parole and probation people on their rolls. However, there seems to be little in the way of a universal official attitude, and it depends very often on the attitude of either the individual judge or the probation officer whether an addict is placed in an institution or referred to a methadone maintenance program. The federal parole system is currently involved in a program which consists of abstinence with frequent urine testing and denying the patient any methadone or other drugs. However, their percentage of effectiveness seems in the area of 15-20%, and I believe their attitude is changing with each new statistical analysis of methadone maintenance vs other modalities. The attitude of our own local jail officials is sometimes disconcerting. It is a bother to maintain a methadone patient on the drug if he happens to be picked up for previous offenses or for new offenses. We are currently involved in a legal battle with jail officials in Baltimore over the advisability of continuing methadone for new prisoners who are already on a maintenance program. There are also objections from purist types who represent such self-help groups as SYNANON, DAYTOP, PHOENIX and so forth. These groups all believe that the addict should be able to make it without the crutch of a drug. Their statistics have never been published so it is hard for me to evaluate methadone vs SYNANON, for instance. It seems that to be effective SYNANON must snatch the addict into its own subculture, thus forming another type of shield around him. I have no objection to this, as long as the person can remain productive and be of some use to society.

The very young heroin addict has always been a frustrating problem to investigators in this field. It seems a pity to let him go downhill without reaching out to help him, but it has been found statistically that he will not respond well until he has reached a certain point of motivation which doesn't usually come until he has been subject to the degradations of the life of the hard core addict. By this I mean multiple arrests and jail sentences and rejection by family and friends, all of whom have been offended by his clever means of acquiring money for drugs. It is my opinion that three years or more on heroin should make a person eligible for methadone maintenance despite his youth.

Program Goal

It should be pointed out that the average methadone maintenance program should also make provisions for education and research as well as treatment. The previously outlined treatment program should make use of addict-patients to move out into the community to speak in such areas as PTA meetings, churches, service organizations, and schools. I find these patients very effective speakers; I have accompanied many of them only to find that they were the center of attention rather than myelf. It is true that the younger people do relate well with the addict patient, and it works both ways. The patient himself receives a great deal of ego boosting in such an arena. We highly recommend a training program for counselors from among the patient ranks as the best alcoholic counselors are also alcoholics. Another form of education is directed to professional personnel such as nurses, emergency room personnel, educators and so forth. We have currently instituted a very popular twenty-hour course in Baltimore using all types of teaching personnel such as lawyers, doctors, and addicts and others familiar with our treatment program.

Another essential phase of any methadone program should be research into possible new and better drugs to be used in place of or along with methadone. Hopefully, statistics will be gathered to make treatment more standardized. The problem of detoxification

Letters to the Editor

To the Editor:

The time of year has again returned when doctors are asked to give to the United Fund, and inevitably questions arise about the appropriateness of this solicitation. For years, doctors have felt that they gave enough of themselves and their time by working in clinics and other areas. Although in some measure this is and always will be true, there are recompenses now which were not available previously, and it is no secret that doctors' incomes have certainly not fallen with the passage of time, no matter what the general economy may have done.

The needs of our fellow citizens which the United Fund fulfills could not be managed in any other way excepting taxation alone. If those who are more fortunate group together In the *United* Fund, we can do this very well. It seems to me that doctors as individuals and as a group would want actively to support such an enterprise. We can help provide needed services to others and maintain the integrity of community undertakings rather than constantly calling for government intervention in areas which should be our responsibility.

Charles L. Minor, M.D.

* * *

METHADONE MAINTENANCE TREATMENT

Continued

also must be solved because currently it is not possible to say how long a patient should receive methadone. It is my firm opinion that almost all methadone maintenance patients will eventually do well when detoxified.

Another research area includes the therapeutic community type of approach either to accompany methadone or to replace it. There are many such places in most communities at this time, but as of now they are not part of the methadone program. Johns Hopkins University is currently about to open a therapeutic community type of approach as part of their drug treatment program.

Other Problems

As new methadone clinics open up in each city, there may arise a competitive situation. The addict is very apt to drift to that facility which is least restrictive. He may be able to get his methadone for a whole week at one facility, or he may be able to avoid urinalysis at another facility. This makes it mandatory that we standardize our procedures to avoid this abuse. Cities having multiple facilities should set up a coordinating council to examine this problem. We have done this in Baltimore and have decided upon identification cards with pictures to prevent patients involving themselves in multiple programs. The question of starting a registry of all known narcotic addiction in a given area is currently being given legislative consideration in many cities. However, some people question the constitutionality of such a requirement, thus impeding progress in this direction.

Conclusions

My experience in this field has led me to the following conclusions.

1. If administered in a clinic setting under precise supervision backed by supportive personnel, methadone is an effective deterrent of opiate abuse in a selected group of "hard core" addicts.

2. There is no evidence that long-term methadone maintenance therapy is damaging to any organ of the body, or detrimental to the emotional and intellectual growth of the patient.

3. The impact of methadone maintenance programs on decreasing big city crime rate is substantial.

Delaware Academy of General Practice

BLUES APPEAL TO PHYSICIANS TO HELP CURB HIGH UTILIZATION

Over-utilization of health insurance benefits — particularly outpatient x-ray and diagnostic laboratory services — may force private health insurers to undertake drastic "belt-tightening." The result? A loss of money to insurers and physicians alike and a loss of faith by the public in the ability of private sector health care providers to meet the nation's needs.

This was the warning given representatives of ten specialty societies, the American Medical Association and the American Hospital Association at a Conference on Health Care Costs sponsored by the Blue Cross Association/National Association of Blue Shield Plans July 23 in Chicago. AAGP Board Chairman James L. Grobe represented the Academy.

According to Blues officials, the Federal Employees Program (FEP) represents an excellent example of the dangers of over-utilization.

The Blues FEP program provides coverage for over five million federal employees and their families. Since 1968 this program has included unlimited use of outpatient diagnostic laboratory services in its benefits in the hope that expansion of outpatient coverage would decrease utilization of more expensive hospital benefits, FEP Vice President Joseph E. Harvey told the conferees. After three years, this hope has not materialized. Demand for these services has increased over 100 percent, accounting for 50 percent of the claims volume and nearly $1 out of every $4 in benefits paid under the program.

Inpatient hospitalization claims have not decreased proportionately, but have remained relatively stable, and a program which had uncommitted cash reserves of $71 million three years ago now finds itself facing a projected year-end deficit of $75 million.

Blues officials admit that an unhappy solution to this unfortunate problem is the only alternative they see. They now are imposing administrative strictures to provide for more effective cost controls, including more careful monitoring of borderline claims and denial of benefits not clearly provided by the letter of the contract with the government. A combination rate increase and benefit adjustment proposal will be made to the Civil Service Commission for next year.

Conference participants were urged to inform their membership of the urgency of the situation and to remind them that diagnostic laboratory coverage is intended only for services needed as a result of illness or injury — not for routine physical examination.

According to Conference Chairman Ira C. Layton, "We must reverse this trend not only in the FEP program, but in all prepayment and health insurance programs with similar experience. If we do not, it can only result in sharp rate and premium increases at a time when the public is increasingly critical about the rising cost of health care. If we can demonstrate a turnaround in the trend, we can document that the private sector is able to react quickly and in a positive manner in this most complex area of health care financing."*

*American Academy of General Practice Chapter News Service.

MISTAKEN Rx

In the August issue of the *Delaware Medical Journal* Henry M. Schwartz was inadvertently omitted from the list of pharmacists who work at SMAC (p. 227-228).

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1935	J. D. Niles	J. B. Waples	C. J. Prickett	W. H. Speer	A. L. Heck
1936	J. B. Waples	M. I. Samuel	C. G. Harmonson	W. H. Speer	A. L. Heck
1937	C. P. White	J. R. Elliott	C. G. Harmonson	W. H. Speer	A. L. Heck
1938	C. J. Prickett	D. T. Davidson	E. L. Stambaugh	A. V. Gilliland	A. L. Heck
1939	M. I. Samuel	B. Barnes	C. G. Harmonson	J. H. Mullin	A. L. Heck
1940	B. Barnes	J. M. Barsky	W. Marshall	C. L. Munson	A. L. Heck
1941	E. R. Mayerberg	W. Marshall	R. C. Beebe	C. L. Munson	A. L. Heck
1942	W. Marshall	R. C. Beebe	P. R. Smith	W. O. LaMotte, Sr.	A. L. Heck
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1944	R. C. Beebe	W. E. Bird	W. C. Deakyne	W. O. LaMotte, Sr.	W. W. Lattomus
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1960	J. E. Marvil	L. C. McGee	C. M. Moyer	N. L. Cannon	C. Levy
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1962	S. W. Rennie	W. F. Preston	H. J. Laggner	J. W. Abbiss	C. Levy
1963	W. F. Preston	F. I. Hudson	C. Levy	J. W. Abbiss	J. W. Howard
1964	F. I. Hudson	G. A. Beatty	R. L. Klingel	J. W. Abbiss	A. D. King
1965	G. A. Beatty	A. M. Gehret	A. J. Morris	J. W. Abbiss	A. D. King
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1967	H. T. McGuire	C. M. Moyer	E. Y. Gledhill	J. W. Abbiss	L. Katzenstein
1968	D. J. Preston	C. M. Moyer	C. Levy	J. W. Abbiss	L. Katzenstein
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Editorials

THE PRIVATE PATIENT AND THE SURGICAL RESIDENT

Socio-economic changes and recent and yet-to-emerge legislation presage the disappearance of the "charity" patient. This permits no alternative but to include private patients in any residency training program. This raises wrenching problems of morality, ethics and economics which must be faced and resolved.

By the time a student receives the degree of Doctor of Medicine, he or she has had schooling equivalent to the most demanding Doctor of Philosophy program. It is assumed that the techniques and commitment of scholarship have been thoroughly assimilated. The residency program, therefore, is essentially an on-the-job training program during which time the habits of scholarship are sustained. Nowhere is this more true than in surgery.

In golf, you can read books, listen to the pro, hit thousands of balls off the practice tee, but unless you "play the course," again and again and again, you cannot become a winning golfer. So, too, in surgery, you can read the books, practice tying knots, hold retractors and watch intently, but if you do not operate, again and again and again, you cannot become a competent and winning surgeon.

What part of the surgical procedure on the private patient should the surgical resident be allowed to do? May he do the preoperative preparation, paint the abdomen, tie a few bleeders, make the incision, and place a few sutures in the anastomosis or do the whole operation skin-to-skin? The obvious and logical conclusion is that the resident should be permitted to perform those functions which he has demonstrated his ability to do well. But this brings us to the crunch question: When the resident reaches that stage of development where he does the whole procedure, has he not, by rigid definition, become the attending surgeon's "ghost surgeon"?

The acrimony cast upon "ghost surgery" derived from the fact that a physician, himself incapable of performing the operation recommended to his patient, enlisted a surgical Hessian to do the job and then charged a fee commensurate with a skill and service greater than he himself could provide. In the properly regulated surgical residency program, nothing is further from the case, for here the attending surgeon bears the weight of concern for his patient and for his own reputation and income. At each step of the way, he must make the critical determination whether the resident is ready to be let out another notch. In addition, any surgeon worthy of participating in a teaching program is voluntarily, if grudgingly, relinquishing much of the gratification of surgery: "Behold the work of your hands."

To those who still insist that it is unethical and immoral, I offer the rebuttal that the old system — the poor man got the resident and the rich man got the chief — was immeasurably more immoral and unethical and cynical. The poor man has little more in life than the contents of his skin. He has no resources to compensate for a disability sustained as a result of surgical ineptitude.

Surgery is particularly vulnerable because it is particularly visible. If an assistant cracks a spleen with a clumsy retractor, or if a defective clamp slips off an artery during an operation by an adept resident, the results are immediately and dramatically apparent. If a medical resident injects a fantastically potent drug into an ill patient and a "code blue" results shortly thereafter, the causal relationship may not be as apparent or witnessed by as many critical observers.

And finally, there appears to be no alternative. If it is not done this way, and sanctioned by the medical profession and public, there can be no source of trained competent surgeons to care for future generations.

HARRY S. RAFAL

WHERE DO WE GO FROM HERE?

The time has come to review the relationships between Pharmacy and Medicine, and for both professions to rededicate themselves to a cooperative effort directed toward the best interests of the patients we both serve.

There are three basic ingredients in this thesis:

1) Pharmacists are highly trained experts in the drug field, and just re-labeling of material supplied by pharmaceutical manufacturers not only fails to satisfy them intellectually, but constitutes a waste to society of an expertise which could be put to better use.

2) The problems of the delivery of health care today are largely those of manpower, both availability and distribution, and to the extent that trained allied health professionals can play a part in solving these problems, a significant and proper role should be found for the profession of pharmacy.

3) The cost of health care today is receiving increasing attention from many concerned sources, and to the extent that this applies to drugs and that drug costs can be ameliorated with due regard to quality not only of drugs themselves but of health care as a whole, pharmacists and physicians should be able to sit down and work out together the means of accomplishing such a goal.

See President's Page, page 260.

Now what has been the course of events to this time? In recognition of the three ingredients mentioned above, a liaison committee between Delaware pharmacists and physicians was created several years ago, out of which grew the Delaware Formulary Advisory Board because the pharmacists felt that a method of controlling costs and preserving quality should receive first priority. The liaison committee was temporarily disbanded, and the Delaware Formulary Advisory Board, with Dentistry and Osteopathy added to Medicine and Pharmacy, undertook to develop a voluntary formulary for the use of prescribers and dispensers as an educational tool to help provide quality drugs at reasonable cost to the citizens of Delaware. The intent of the physicians involved was to develop an informational source so that both prescribers and dispensers could more intelligently furnish patients with quality drugs at reasonable cost. It developed that the intent of the pharmacists involved was to transfer to the community the bid system used in hospital pharmacies with the goal of limiting retail pharmacists' inventory to those brands selected by the Delaware Formulary Advisory Board. Two barriers emerged. First, pharmaceutical manufacturers refused to submit any bids when requested, saying that would be in violation of the Robinson-Patman Act.

Second, the pharmacists were informed that the mere publication of a list of drugs and brands selected for community use might expose the Delaware Formulary Advisory Board to the possibility of suit through the Sherman Anti-Trust Act. It was then decided that, since a state agency is less likely to be sued under anti-trust legislation than a private group, we would limit the experiment to recipients of aid under Title XIX (Medicaid), with the Department of Health and Social Services as a protective cloak. (It should be remembered here that the whole project of the Formulary Advisory Board was originally meant to be an experimental and pilot program to run for one year, and to be continued and expanded only if analysis at the end of that time indicated some significant achievement of stated goals). That this be done was approved by the Medical Advisory Committee to the Division of Social Services, and this seemed to the physicians involved, at least, to satisfy the conditions required to set up an experimental program which might or might not at some future time be expanded under suitable conditions to cover all the citizens of Delaware. Nothing was ever discussed about implementing any part of this program through the medium of state legislation, but so dissatisfied were the pharmacists involved in limiting this experiment to Title XIX patients and so dedicated were they to the proposition of a statewide community formulary, and so convinced were they that the latter could not be done without the legal protection of state legislation, that unilaterally they waited until the next to the last day for the introduction of new legislation, found a sponsor, submitted enabling legislation, and after the fact notified the other professions supposedly playing a part in these decisions. This is not the kind of action which encourages cooperation between professions toward accomplishing the really desirable goals previously outlined. We believe that what we originally set out to do can be accomplished by voluntary, educational, and non-legislative means, and indeed that all such means in any area of endeavor should be thoroughly utilized before casting it in the rigid structure of statutory acts.

Unfortunately this legislation appeared on the surface to legislators like "motherhood stuff" and passed the Senate in the last session with no difficulty. It is due to come up in the House in the next session.

I would at this point call your attention to a resolution passed at the 1970 meeting of the House of Delegates of the Medical Society of Delaware, of which the last resolve reads:

"Resolved, that this House of Delegates reaffirm its support of the Society's cooperative efforts with pharmacy and others through the Delaware Formulary Advisory Board, and in addition instruct the trustees to devise other mechanisms through which medicine can more fully utilize the knowledge and expertise of pharmacy for the benefit of the patient without the improper delegation of medical discretion and judgment."

We are genuinely interested in the accomplishment of progress toward the three ingredients introducing these remarks. This can be done only by cooperation, and not by having the very people we are trying to help precipitously flying off in the direction of unilateral action because they have made up their own minds ahead of time what they will achieve, "come hell or high water."

I therefore recommend that the pharmacists withdraw the formulary legislation waiting for action in the House of Representatives, that the existing Delaware Formulary Advisory Board be disbanded, and in the spirit of the quoted resolution from last year's House of Delegates meeting, that a broad-based liaison committee between medicine and pharmacy be developed for the purpose of addressing itself to the solution of the many problems and the realization of the many opportunities which confront both of our professions. In no other way can the best interest of the public be served, and in no other way can pharmacy avoid its real fear as recently expressed by the President of the American Pharmaceutical Association when he said: "Every year that passes brings us that much closer to the day when we will either find pharmacists as full fledged partners on the health team or as relics of a former era in health care delivery."

W. O. LaMotte, Jr.

* * *

The Medical Society of Delaware gratefully acknowledges the assistance of the following in the presentation of the program for the 182nd Annual Meeting:

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RECURRENT VIRAL INFECTION: AN ANNOTATION

The ability of currently available rubella vaccines to confer permanent immunity has been questioned because of documentation of reinfection in vaccinees.[1] Study of this problem has stimulated further inquiry[2] into the frequency and conditions of reinfection, not only in rubella, but in other viral infections such as herpes simplex, varicella-herpes zoster, cytomegalic inclusion disease, respiratory viruses, rubeola, recurrent viral meningitis, vaccinia and variola, enteroviral infections and viral hepatitis.

The recurrence of a viral infection or reinfection is one occurring in a person with partial immunity induced by prior infection with the same virus. Reinfection can be classified as endogenous or exogenous. An endogenous reinfection can occur by reactivation of a latent virus, eg, herpes simplex, herpes zoster, cytomegalovirus and rubeola (subacute sclerosing panencephalitis). Examples of exogenous reinfections include those due to respiratory viruses, smallpox, viral hepatitis, etc. As Chang summarizes, in a primary infection there is no prior antibody, there is the initial production of IgM followed by appearance of IgG, and there is the expected clinical manifestation with diagnosis proved by isolation of virus in addition to a specific serological response. In contrast, with reinfection antibody is usually detectable in low titre; as a rule there is only IgG production and antibody response may be depressed and give rise to cross reactions. The clinical picture of reinfection is variable. It may be inapparent or mild or localized or, as in subacute sclerosing encephalitis due to measles virus, it may be fatal. Diagnosis of reinfection is difficult in exogenous reinfection due to decreased viral excretion and serology unreliable in endogenous reinfection. Conversely, diagnosis of exogenous reinfections will depend upon serial serologic determinations whereas in endogenous reinfection virus isolation is the method of diagnosis.

Primary herpetic stomatitis presents in a characteristic form that is familiar to physicians caring for children. Reinfection with herpes simplex virus occurs on the lips, cervix, vulva, cornea, conjunctivae and skin; data suggest too that herpes encephalitis is caused by an endogenous reactivation by herpes virus. Exactly what causes reactivation of herpes virus is unknown, although factors such as fever, certain infections (pneumococcal and meningococcal), menses, corticosteroid administration, exposure to sunlight, surgery of the trigeminal nerve and emotional stress have been noted. Of particular interest to the pediatrician, is the newborn of a mother who has a reinfection; by herpes simplex virus labial, vulvar or cervical lesions present and constitute a distinct danger to the newborn infant.[3]

Endogenous reinfections by the varicella-zoster virus is typical of a disease — chickenpox — that presents with hematogenous dissemination in the primary infection and in a localized form — shingles — in the reinfection. In this regard it is important to those responsible for children's wards that individuals with shingles not be admitted inasmuch as epidemics of chickenpox due to exposure of susceptible children to patients with shingles have been recorded.

Cytomegalic inclusion disease is an infection that is assuming more importance as its frequency in patients with cancer and patients receiving immuno-suppressive agents becomes appreciated. At times it is difficult to differentiate whether the cytomegalovirus is presenting as an endogenous or exogenous reinfection. Fresh blood transfusions, particularly in cardiopulmonary bypass procedures, have been implicated in exogenous reinfection of cytomegalic inclusion disease.

Chang cites the well-known frequency of reinfection by respiratory viruses and gives two explanations for this susceptibility: the constant replacement of resistant epithelial cells by new sensitive cells and the inability of serum neutralizing antibody to reach the superficial epithelial cells. He mentions that exogenous infections are usually mild or inapparent, the one major exception being that of young infants who are exposed to respiratory synctial virus and either because of congenitally acquired antibodies or previous active immunization have a severe disease.

Data as cited indicate that reinfection does occur in measles, and these reinfections act as boosters to maintain a protective antibody titre. Of serious import is the fatal disease, subacute sclerosing panencephalitis of Dawson, which is an example of an endogenous reinfection by the measles virus.[4] An interesting clinical finding is cited by Chang that most patients with subacute sclerosing panencephalitis give a history of measles in the first year of life, and he raises the question as to whether or not rubeola vaccine should ever be given to anyone less than one year of age.

Rubella data mentioned at the beginning of this annotation have shown a frequency of 84% in the vaccinees studied by Horstmann with a frequency of 3.4% in naturally immune individuals. These exogenous reinfections have been inapparent and the reinfected vaccinees were considered unlikely to be contagious. Of critical importance, however, in this respect, and as yet unanswered, is the question whether or not reinfection of either a vaccine-immune or a naturally immune individual who is pregnant would lead to congenital rubella.

The need to revaccinate persons against smallpox in endemic areas every three years is recognized. An interesting clinical type of reinfection with smallpox occurs in the weeping mothers[2] who have partial immunity and who may auto-innoculate their conjunctivae unintentionally at the death of a child and have a smallpox conjunctivitis as the only manifestation of smallpox reinfection.

Recurrent viral meningitis has been pointed out frequently in the past. This problem has been elucidated by better viral studies of these patients; the majority of these patients have been shown to have enteroviral infections, specifically Coxsackie and Echo viruses of different types. Reinfection by a serum hepatitis has been documented in drug addicts[5] based on the presence of hepatitis associated antigen in their serum. In one cited study there was a reinfection rate of 5.5%, and apparently too, reinfections with serum hepatitis virus can occur following transfusions.

In his final comments Chang correctly states that the frequency of reinfection and its consequences are an important aspect of our knowledge of the natural history of viral diseases in man. Reinfection obviously occurs because of an incomplete resistance, whether this be humoral or cellular. Both are very complex systems that are being studied by many investigators of infectious diseases.

H. R.

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MASS IMMUNIZATION AGAINST RUBELLA: FOR BETTER OR WORSE?

In an attempt to prevent a recurrence of the 1964-65 rubella debacle in the United States, immunization of children between one year and puberty has been conducted on a massive scale. In April, 1969, the Advisory Council on Immunization of the United States Public Health Service recommended immunization of school age children to diminish the population which might acquire and spread rubella virus. Thirty thousand infants suffered damage in utero from rubella in the 1964-65 epidemic. Medical care for these children will cost more than 2 billion dollars, and no one can measure the emotional damage wrought upon those affected and their families.

It is too early to determine whether mass immunization against rubella will diminish damage to infants born in the future, or whether mass immunization might prevent the large epidemics that have been so devastating in the past. Although speculative, several authors in recent years have raised a worrisome question: Will the mass rubella immunization program indirectly result in an even greater rubella pandemic in the future than has been witnessed in the past?

A basic tenet of immunology states that natural immunity provides better defense than artificially acquired immunity. However, with rubella, how much better? Does partial immunization of the mother prevent the ravages of congenital rubella? Does rising titer indicate viremia? How long will immunization in these young children last? How high must a titer be to prevent viremia? Such worrisome questions provoke serious concerns for several disciplines.

Only a prospective study of three groups performed in an epidemic, utilizing identified, naturally immune, vaccinated and non-immune pregnant patients will provide information needed to derive meaningful answers. Hopefully, such a study would be designed to include:

A. Maternal manifestations of rubella.
B. Conversion and/or increases in rubella antibody titers.
C. Congenital defects in offspring.
D. Presence of virus in newborns after birth. (The infected infants may continue to harbor and excrete rubella virus after birth, representing a serious threat of infection to pregnant personnel in the nursery and contacts at home following discharge from the hospital.)

There is a particularly troublesome question: How long does immunization conferred by attenuated rubella virus last, and will the mass immunization program currently being conducted among the young produce a population that will continue to be immune into the childbearing years? Or, more ominously, will there be a generation of inadequately immunized young women whose own infants will be susceptible to damage by rubella virus?

Obviously, more questions have been raised than answered. Only time will tell us whether the wiser course would have been less broadly based immunization restricted to susceptible young women after appropriate testing. Without mass immunization, most infants and young girls will have rubella, from the wild virus, a mild disease of childhood, thereby attaining natural immunity. Prior to pregnancy, perhaps, through a program of premarital blood testing, those not immune could be identified and immunized with the best available vaccine. At the present time, only fifteen to twenty percent of the adult population are non-immune. The other eighty to eighty-five percent of childbearing women presumably enjoy natural immunity instead of immunity conferred by immunization in childhood with apparently lower titers of unknown duration.

Obviously appropriate prospective studies should be performed before initiating (or abandoning) any program. Extensive testing for immunity, before immunization during the school years, premaritally, and certainly before undertaking childbearing seems worth considering. The absence or presence of immunity in any individual could be determined with our present capabilities. At least until we know how effective and for how long the duration of the immunity conferred by the various vaccines, such testing would seem appropriate to all young women in the childbearing years.

W.D.J.

* * *

GP — DEAD OR ALIVE?

The handwriting on the wall clearly states that the classic general practitioner of the past is, if not dead, dying. A commonly endorsed projection is that we need physicians with a blend of training consisting principally of internal medicine, pediatrics, psychiatry, and perhaps a bit of minor surgery. Whether this practitioner, designed by a committee and suffering from all the hazards of such design, is viable or not remains to be seen. Preliminary impressions would indicate that it isn't a popular goal for the current medical student.

Warren, JV: The Problem of Providing Health Services,
Ann Intern Med 69:951-955, 1968.

President's Page

PHARMACY AND MEDICINE: A POINT OF VIEW

Maturity comes to everyone as growth is attained. They are hand in hand, growth and maturity. Medicine has grown, pharmacy has grown, yet physicians and pharmacists have not matured together. It is becoming more obvious that a blending of these two is a necessary goal, if not now obtainable, certainly in the future.

The intricacies of incompatibility *in vivo* are multiplying; the standard of *in vitro* incompatibility is no longer the number one responsibility of the pharmacists. In spite of his increasing responsibility, the pharmacist has more time on his hands calling out for use of his professional training and not being used to his full potential.

See editorial on page 255.

Three years ago it was agreed to form a joint formulary committee to present to the public a less expensive means of purchasing acutely needed medicines. This committee worked from an initial group of some twenty plus drugs to a present list of only seven medicines. Advice from legal counsel caused certain members of the Formulary Committee to go for the protective action of establishing a formulary by legislation.

Many of us have felt that cooperation should be the watchword of our first joint venture into the realm of reducing the health care costs. More than this, it has been the feeling that a team should be formed that has mutual understanding and a combined interest in achieving the greatest use of the capabilities of both the physician and the pharmacist in the health care field. We must not stub our collective toes, we pharmacists and physicians, by not working together

At our 1970 annual meeting the House of Delegates unanimously passed the following resolution:

> "*Resolved,* That the Medical Society of Delaware strongly oppose any efforts to repeal the anti-substitution laws in this state because such a move would not be in the best interests of the patient and would result in the involuntary delegation of medical judgment and discretion; and be it further
>
> *Resolved,* That this House of Delegates reaffirm its support of the Society's cooperative efforts with pharmacy and others through the Delaware Formulary Advisory Board, and in addition instruct the trustees to develop other mechanisms through which medicine can more fully utilize the knowledge and expertise of pharmacy for the benefit of the patient without the improper delegation of medical discretion and judgment."

Rhoslyn J Bishoff

In Brief

Attention, Physicians!

If you are interested in obtaining an associate or a partner, or are looking for specialists to form a group practice, register a request at the Medical Society of Delaware executive office. Inquiries come into the office frequently from well-qualified physicians, looking for a new location. We can steer them your way if we know of your interest. Please help us to help you. Call 658-7596 or 652-6512.

Save Your By-Laws

PHYSICIANS, note the complete Medical Society of Delaware Charter an dBy-Laws in this issue of the Journal. It's an insert which can be removed from the magazine and preserved for ready reference in your files. It's independently numbered and separately stapled for easy removal. Look between pages 252 and 253 for your personal copy.

Speakers on "Ask the Doctor"

Speakers for October 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: October 5, Calvin B. Hearne, M. D., *Toilet Training;* October 12, G. Howard Kimball, M.D., *Tetanus;* October 19, John E. Benzel, M.D., *Abnormal Blood Clotting;* October 26, Theodore Strange, M.D., *Fractures of the Hip.*

Cancer Survey

According to figures released by the Tumor Clinic at the Wilmington Medical Center, the most common cancers in that registry last year were breast (200), lung (195), colon (124), and prostate (75).

Meeting Medical Costs

Senator William V. Roth, Jr., in releasing results of a questionnaire he submitted to Delaware voters, reports that of three plans suggested for assisting persons in meeting medical costs, 28.1% of the respondents picked *income tax credits to individuals for their payments for private health insurance* (costing approximately $16 billion per year), 23.8% picked *a national health insurance program for all Americans financed jointly by the Federal government, individuals, and employers* (costing between $53 and $77 billion per year, and 19.4% chose *Federally-financed insurance for the poor and a catastrophic insurance program for all other families* (costing between $4.3 and $5.3 billion per year). *None of the above* was the choice of the other 28.7%.

Immunization Warning

Delaware physicians are urged to remind parents of the continuing need for immunizations against polio and measles by the federal Center for Disease Control Immunization. Large numbers of children do not receive polio or measles immunizations until they start school, and many do not receive them even at school age. Such a wait leaves the child unprotected during a most vulnerable period of his life, when he is most at risk of developing complications from the disease, and provides a large group of unprotected children to become a pool through which an epidemic can spread. Protect your young patients by immunizing them now.

20 Delawareans Chosen by DIMER

Twenty Delaware residents have been admitted for the fall term to Jefferson Medical College under a cooperative program established almost two years ago under the aegis of the Delaware Institute of Medical Education and Research (DIMER), according to a news source at the University of Delaware Office of Public Information.

The University of Delaware and the Wilmington Medical Center are partners in the program through which Jefferson admits 20 Delaware residents each year. The Delawareans may have taken their undergraduate work at any college offering an accredited premedical program. Colleges represented among the twenty selectees are Williams, Fairleigh Dickinson, Trinity, New Hampshire, St. Joseph's, Delaware (8), Amherst, Princeton, Franklin and Marshall, Drexel, North Carolina, Shepherd, and Pennsylvania.

Child Abuse

Under a revision of the Child Abuse Act passed during the recent session of the General Assembly, physicians and others must report cases of serious physical injury inflicted upon a person who is chronologically or mentally under 18 years by other than accidental means, or whose physical or emotional condition gives indication of other serious abuse, or maltreatment or non-treatment. A report must be made to the Division of Social Services of the Department of Health & Social Services. Said report may be made orally, including by telephone, to the Regional Office of the county of the child's residence. In New Castle County call 762-6860 from 8 a.m. to 4:30 p.m.; 654-4411 between 4:30 p.m. and 8 a.m. and on weekends and holidays. In Kent County call 678-4800 at any time. In Sussex County call 856-2564 between 8 a.m. and 4:30 p.m.; 227-7174 or 875-7146 between 4:30 p.m. and 8 a.m. and on week-ends and holidays.

RECOMMENDATION OF PHS ADVISORY COMMITTEE ON IMMUNIZATION PRACTICES

Influenza Vaccine

Influenza occurs in the United States every year, but the incidence and geographic extent vary widely. Periodically, it appears in epidemic form as a result of antigenic variation in prevalent viruses and the relative susceptibility of the population. Both type A and type B influenza viruses undergo antigen changes. Antigen shifts usually occur slowly, but occasionally they are rapid and abrupt. Epidemics caused by type A influenza viruses occur more frequently and are generally more severe than those caused by type B.

Inactivated influenza vaccines* have not been used to control epidemic influenza in the general population. Their effectiveness is variable, and protection is relatively brief. Nevertheless, since they are the only available influenza preventives, they should be given to chronically ill patients and possibly to older persons in general. These two groups appear to be more vulnerable than others to serious cases of influenza and its complications. Because some influenza occurs each year, annual immunization of "high risk" patients is indicated as a routine procedure regardless of the amount of influenza expected in any specific geographic area.

Influenza Virus Vaccines

The Division of Biologics Standards, National Institutes of Health, reviews influenza vaccine formulation regularly and recommends reformulation, when indicated, to include contemporary antigens. Strains of influenza A examined in the United States and abroad in 1970-71 did not differ significantly from the Hong Kong strain, A2/Aichi/2/68. For 1971-72, the composition of the vaccine will remain the same as the bivalent vaccine rec-

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*The official name of the currently available product is Influenza Virus Vaccine, *Bivalent*.

ommended for 1970-71. The adult dose of inactivated influenza vaccine will contain 400 chick cell agglutinating (CCA) units of type A2 antigen (A2/Aichi/2/68) and 300 CCA units of type B antigen (B/Mass 3 66).

Highly purified vaccines will be available from most manufacturers. These vaccines are equivalent in potency to earlier vaccines, but since they contain less nonviral protein, they are the recommended products where available. Patients who have had severe local or systemic reactions to influenza vaccine should experience less discomfort when highly purified vaccine is used.

Vaccine Usage

Annual vaccination is recommended for persons who have chronic debilitating conditions: 1) congenital and rheumatic heart disease, especially mitral stenosis; 2) cardiovascular disorders, such as arteriosclerotic and hypertensive heart disease, particularly with evidence of cardiac insufficiency; 3) chronic bronchopulmonary diseases, such as asthma, chronic bronchitis, cystic fibrosis, bronchiectasis, emphysema, and advanced tuberculosis; 4) diabetes mellitus and other chronic metabolic disorders.

Although the value of routinely immunizing all older age persons is less clear, those patients who have incipient or potentially chronic disease, particularly affecting cardiovascular and bronchopulmonary systems, should also be considered for annual immunization.

Immunizations of persons who provide essential community services may also be considered if local priorities justify. However, before undertaking such programs, responsible physicians must take into account a number of reasonable constraints: difficulties inherent in predicting influenza epidemics, variability of vaccine effectiveness, incidence of adverse side effects, cost, availability of vaccine, and risk of diverting vaccine from those with chronic debilitating conditions who are at risk.

Schedule

The primary series consists of two doses administered subcutaneously, preferably six to eight weeks apart. (Dose volume for adults and a detailed schedule for children are specified in the manufacturers' labeling.) Persons who have had one or more doses of vaccine containing the Hong Kong strain antigen (all influenza vaccines since 1968-69) need only a single subcutaneous booster dose of bivalent vaccine. All others should receive the full primary series. Vaccination should be scheduled for completion by mid-November.

Precautions

Influenza vaccine is prepared from viruses grown in embryonated eggs and ordinarily should not be administered to persons clearly hypersensitive to egg protein, ingested or injected.

CLINICAL NOTICES AND MEETINGS

AAP: Children and Television

A National Symposium on Children and Television, co-sponsored by Action for Children's Television and the American Academy of Pediatrics will be held October 18, 1971 during the AAP annual meeting in Chicago. The symposium will seek to stimulate new creative efforts for children's programming and suggest improvements for existing programs. Information concerning the annual conference may be obtained by contacting Mr. John Lynch or Mr. Paul Witbrod at the AAP Evanston office, 1801 Hinman Avenue, Evanston, Illinois, 60204.

Tri-State Internists Meeting

The American College of Physicians (Tri-State Regional: District of Columbia, Delaware and Maryland), will sponsor a tri-state regional scientific meeting for specialists in internal medicine and related fields, October 16, 1971 at the University of Maryland School of Medicine, Baltimore. For information write: Martin L. Singewald, M.D., 11 E. Chase Street, Baltimore, Md., 21202.

ACP Courses

The American College of Physicians will present *Diabetes—An International Review—The 50th Anniversary of Insulin,* October 21-23, 1971 at Indiana University School of Medicine, Indianapolis, Ind.; *Recent Progress in Clinical Cancer,* October 25-29, 1971 at Memorial Sloan-Kettering Cancer Center, New York, N.Y.; and *Current Concepts of Clinical Infectious Diseases,* Nov. 3-5, 1971 at University of Virginia School of Medicine, Charlottesville, Va. Write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Philadelphia, Pa. 19104.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

SURGEON: Board eligible. Taking boards in December.

SURGEON: Board eligible. New York University graduate. Residencies, University of Chicago and George Washington University. Experience in Vietnam in trauma and vascular surgery. Currently surgical consultant in Surgeon General's office. Available July 1972.

ORTHOPEDIC SURGEON: Licensed in Delaware.

INTERNIST: Board-certified. Interested in area of 15,000-150,000. Available July 1972 following completion of military service.

INTERNIST: Board qualified. Subspecialty training in hematology. Available September 1972.

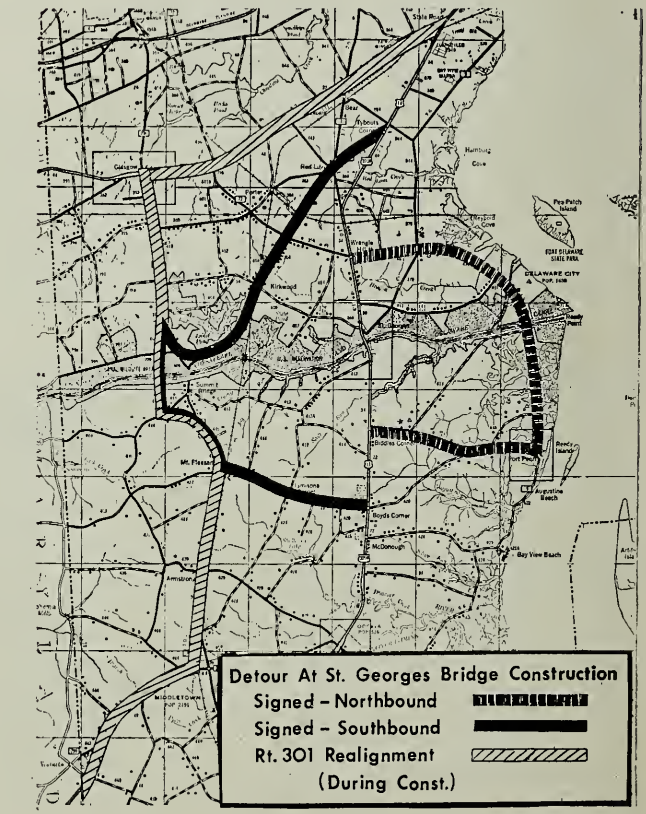
PEDIATRICIAN: Passed Part 1 of specialty boards. ECFMG. Residency, Montefiore Hospital, New York. Interested in Delaware job opportunities.

* * *

MEDICAL SOCIETY OF DELAWARE ANNUAL MEETING DETOUR ROUTES

Physicians traveling to Dover from north of the Chesapeake and Delaware Canal, please note.

Because of construction on the St. Georges Bridge, detour routes will be in effect when the House of Delegates Meeting and the Socio-Scientific Session are held on October 8-9. Use either Summit Bridge or Reedy Point Bridge as an alternate route. Call the Society office for more specific instructions if needed.



THE FORUM

Environment And Health

AN OPEN LETTER: IT'S ALL YOURS

Several years ago this space was purchased by the Delaware Tuberculosis and Health Society for the purpose of bringing to the medical profession observations pertaining to environmental health.

Contributors to this page have been connected with the Delaware Tuberculosis and Health Society, the University of Delaware, or the Medical Society of Delaware.

No program should be allowed to continue indefinitely without review. As the Tuberculosis and Health Society has reviewed the contribution through the *Journal*, it has come to the conclusion that there is no measurement of the impact that this offering has upon physicians in the state, and more than that, that contributions from physicians to this question have been limited in number.

Beginning with the October 1971 issue, therefore, this space will be turned over to members of the Medical Society as a space in which questions can be raised pertaining to environmental health or the ecology of the state, and the Tuberculosis and Health Society will work through its sources to provide answers to these questions.

The page may also be used by physicians to write their observations about the issues affecting the ecology of the state, subject to acceptance by the editors of the *Journal.*

The Delaware Tuberculosis and Health Society hopes that by this means there may be achieved a better awareness of those matters which concern physicians as they ponder the state's environmental health problems and also there may perhaps be established better communication among the doctors of the state on this issue that is not only vital today but also has such great long-range significance.

RICHARD R. GRIFFITH, *President*
Delaware Tuberculosis and Health Society

This page is sponsored by the Delaware Tuberculosis and Health Society.

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ANNUAL MEETING

Medical Society of Delaware

OCTOBER 8-9, 1971

DOVER DOWNS, DEL.

* * *

House of Delegates

October 8, 1971

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Delaware
Medical Journal

OCTOBER, 1971
VOLUME 43
NUMBER 10

COMMUNITY MEDICINE AND THE INNER CITY

• Physicians are considered reactionary. That's nonsense. Physicians have been in the vanguard of trying to improve society since medicine and society began. They continue to struggle with all the problems which make men sick and are very much concerned with the sickness of urban America. That's what "community medicine" is all about.

Patrick B. Storey, M.D.

There are few things that one can say without stimulating argument. One of them is that the societal state of our principal cities has become so bad that they are unfit for habitation in many sections and unsafe at night in all sections.

The task of rehabilitating our cities is one which we must all face. The effort to produce an urban environment which will allow the creative development of all our citizens should be the dominant theme of our societal development for the next ten years.

The problems of housing, transportation, education, and health care which exist today in America can only be viewed with a strong feeling of shame for the present and with considerable apprehension for the future by those of its successful citizens who live apart from the cities but continue to use city resources for their personal gain. A period of work in the inner city itself discloses the reality of those remote citizens as the "absentee congregations" who still come into the inner city on Sundays to attend *their* churches, to the inner city in case of illness to be hospitalized in *their* hospitals, and even to the inner city to visit *their* long-standing personal physicians.

The problem of reorientation to the city must be approached in many spheres of societal activity. New concepts have to be developed of what our society is all about, and new approaches taken to the redistribution of our national resources to provide better living conditions in all our cities.

Dr. Storey is Professor and Chairman, Department of Community Medicine, Hahnemann Medical College and Hospital.

This paper was originally presented at the Tuesday Morning Medical Conference, WMC, October 13, 1970.

One of the concepts with which we have been concerned is that of a reorientation between institutions and communities. We have looked upon an institution as a categorical part of the establishment. For example, a hospital is a single institution of the health care establishment, and a medical school is a single institution of the medical educational establishment. Similarly one must define "community." We have chosen to regard "community" as a regional phenomenon, and a local phenomenon. Thus the regional community of the Greater Delaware Valley includes both Philadelphia and Camden and their suburbs, plus some other smaller but still sizeable cities and their suburbs, such as Wilmington, Scranton and Wilkes-Barre, with a total population base of ten million people. The area is served by a substantial number of large hospitals and medical school-hospital complexes located principally in Philadelphia, but also in each of the major cities of the area. The local community is that geographic area which immediately surrounds each major institution of the health care establishment.

The general orientation and the usual point of view of the decision-making members of such institutions are regional and national. The reorientation which must be developed has to do with the immediate community of the institution.

This concept holds true for each and every institution which must seek a new role for itself vis-à-vis the immediate community which it serves. In many cases this will represent not so much a *replacement* of the regional concept of service by a community orientation, but a deliberate reconsideration of the *addition* of a community orientation to the regional concept. Just as the implementation of the regional concept has been disastrous without adequate attention to local community, so also a community orientation with deliberate disregard of the regional role of the institution would be equally disastrous. Divisions within our urban-suburban complex are to be overcome and not perpetuated or exaggerated.

Development of Departments of Community Medicine

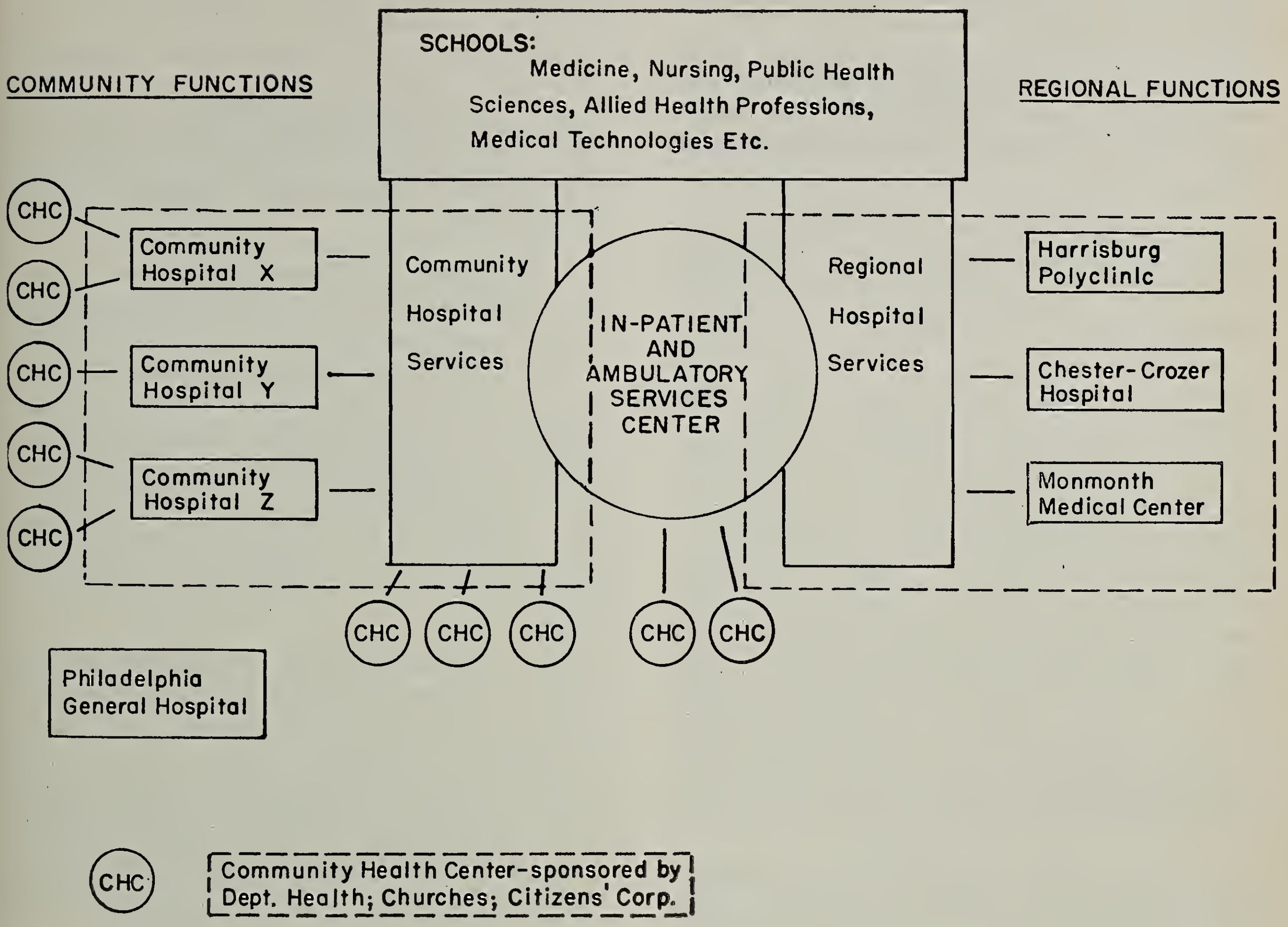
One mechanism for approaching this problem on the part of the community health care establishment has been the development of departments of community medicine in medical schools and large hospitals throughout the country. Basically, these are units of the establishment devoted to the study and solution of problems in delivering first class coverage of health care to all members of our society. Such units are not so much operational attempts actually to provide such services as they are mechanisms of guidance for development of a community orientation by the traditional clinical disciplines. In this respect, a Department of Community Medicine is conceptually completely different from a Department of General Practice, (or using the new name, a Department of Family Practice). In this regard also a Department of Community Medicine is entirely different from Departments of Preventive Medicine and Public Health in the usual sense of those designations. Both preventive medicine and public health are disciplines on whose principles a Department of Community Medicine must rely very heavily. But in the United States the concepts of community medicine are currently under development and perhaps the closest designation from historical usage is that of "social medicine."

Development of Comprehensive Health Care in Philadelphia

In the past five years in Philadelphia, several health oriented institutions have made substantial efforts to develop comprehensive health care services for citizens of the city, particularly those who have been most in need of such services under previous arrangements. There are four processes going on to which we should refer:

1) The effort by the Philadelphia Department of Health to assure reasonable comprehensive health care services in its own health centers by a change away from the categorical system of typical public health care to broader utilization of the health centers. The Health Department has also been involved

FIGURE 1


SCHOOLS:
Medicine, Nursing, Public Health Sciences, Allied Health Professions, Medical Technologies Etc.
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REGIONAL FUNCTIONS
CHC
Community Hospital X
Community Hospital Y
Community Hospital Z
Community Hospital Services
IN-PATIENT AND AMBULATORY SERVICES CENTER
Regional Hospital Services
Harrisburg Polyclinic
Chester-Crozer Hospital
Monmonth Medical Center
Philadelphia General Hospital
CHC
Community Health Center-sponsored by Dept. Health; Churches; Citizens' Corp.

in extensive planning oriented to a new role which the Health Department might play in the provision of personal health care services;

2) The active development by several of the Philadelphia medical schools of Departments of Community Medicine with concomitant development of comprehensive personal health care services on a neighborhood base;

3) The maturation over several years of an Organization for Comprehensive Health Planning under Public Law 89-749; and

4) Development of the administrative structure of the Regional Medical Program for the Greater Delaware Valley, which basically seeks to deploy to all citizens the accomplishments of American medical science as presently reflected in the medical centers.

All four of these developments converge on one particular problem area: the need for development of a conveniently located comprehensive health care system for all of our citizens and for development of accessible back-up medical center resources for that system.

Overview of Community and Regional Roles in Hahnemann

At this very moment a center city institution such as Hahnemann can be viewed in terms of its regional function, ie, the role it serves for a population base of ten million people in the Greater Delaware Valley, and its immediate community. In our case we have elected to call our immediate community the *primary service area,* which is the area between the Delaware and Schuylkill Rivers, which extends from Montgomery Avenue South to Chestnut Street and contains approximately 217,000 people. Planning for the future of Hahnemann must include both regional and community planning. Either type of activity for an educational research resource such as Hahnemann, is not complete without the other.

The relationship between the regional and community function is illustrated to a certain extent in Figure 1 and its explanatory notes.

If one may be relatively simplistic for purposes of illustration, one may look at the right side of that chart as the *system of care for disease*, or as the expression of an advanced diagnostic-therapeutic process, or as that aspect of the health care system which deals with the more or less complex problems of derangement of health. It is the area which has been so well developed since the war at medical-care institutions like Hahnemann. It represents the output of American medical science and of the very highly developed American medical education process. It represents the medical center type of selected health care activity, as distinguished from the every-day care of common clinical problems. It does not include in its actual program any organizational or practical expression of community health-oriented thought.

The community function of institutions such as Hahnemann has been atretic in postwar development. The organization of health care services, the community environment, and the milieu in which medicine is practiced have not heretofore been considered within the domain of the medical college and hospital. But Hahnemann, along with many other institutions, has moved into this area in the past several years. It is located in center city Philadelphia at the base of the north-central residential area of the city, which was the scene of the first significant urban disturbance in 1964.

Hahnemann's Mental Health Center

Specific expressions of Hahnemann's developing community interests have been the development of its Mental Health Center, which serves the population of 217,000 people between Chestnut Street and Montgomery Avenue; a Children and Youth Program, which services the same area and has now grown to the limits of its resources; a Maternal and Infant Care Program, which provides obstetrical service to 600 mothers of the area per year; and a Department of Community Medicine which has established one Community Health Services Center and is involved now in the development of others as the people of the adjacent communities have become aware of the existence and the activity of the first center.

On January 6, 1970, with a five-year period of development as background, the College Council and the Hospital Council of Hahnemann unanimously adopted a resolution which significantly committed Hahnemann to development of comprehensive community-based health care services for the 217,000 people of the Primary Service Area. This resolution was accepted by the Board of Trustees at Hahnemann at its meeting on January 27, 1970.

Such a plan involves development of 8-12 community health service centers, involves explication of the relationship of the existing community hospitals in this area to each other, to these neighborhood health centers, and to Hahnemann, and involves a reorientation of the segments of the Hahnemann institution to each other vis-à-vis the development of their community relationship.

A Tri-Phasic Approach

Ultimately, as the community and regional concepts mature in relation to each other, the services now provided at the Feinstein Polyclinic (private) and at the Race Street Outpatients Department (clinic) will be corrdinated into a single system, and we will eventually need to build a new physical plant for an ambulatory health services center to serve as the back-up resource for both the community and the region. The Outpatient Department Committee of Hahnemann has proposed a tri-phasic approach to this objective.

Phase 1. Incremental improvements of the existing OPD, oriented to immediate solution of problems listed in the Melnick Report (a survey of the OPD carried out in 1968) to document its problems which have not already been handled. For example, it is proposed to use personnel now in training at the Spring

Garden Community Services Center to facilitate patient flow between the community and the Outpatient Department and the Emergency Room.

Phase 2. A "pre-building" restructuring of the OPD, with establishment by Hahnemann of a medical director, a nursing director, and an administrator, with adequate supportive staff, a reorientation of the relationship between inpatient and outpatient services, and a reorientation of the relationship between the OPD, the emergency room, and the two community service centers now in operation.

Phase 3. Development of a new Hahnemann Ambulatory Services Center fully capable in terms of space, equipment and personnel to handle both the community and regional responsibilities of a major medical care institution. Phase 3 represents long range planning, the details of which cannot really be foreseen but will probably entail new construction and surely will involve merging of the private and public services.

At the same time that we continue with development of a planning process by the health care providers we are proceeding with development of community participation in the planning process. The staff of the Department of Community Medicine is presently very much involved in the identification of community planning resources.

Present Status of Development of Community Oriented Services

It is clear that from the point of view of community people, nothing takes precedence over the care of their children and over the urgencies of pregnancy. Thus, the incorporation of well developed pediatric and obstetrical-gynecologic services into any health care program is most important. This point must be kept clearly in mind in the subsequent discussion of comprehensive health care service.

A second principle which must be stated clearly at the outset of any discussion of comprehensive health care services in the inner city is that the problems of housing, of nutrition, and of a disordered societal relevance which result in a high frequency of such problems as poor education and understanding of so-called middle class values, of drug abuse, of alcoholism, and of the "social diseases" must be actively accounted for in a health care program. There can be no caviling about this. Any concept that comprehensive health care activity can be restricted to the diagnostic and therapeutic process is out of place in a community such as ours. Thus, any approach to comprehensive health care must involve a broad approach to the individual in his family and in the context of the problems of his community.

In December of 1966 the Department of Community Medicine at Hahnemann began to express its interest in the community immediately adjacent to Hahnemann. Through a collaborative effort with existing community resources a large building was purchased and converted to use as a community services center. The details of this development are not immediately pertinent except to make several points:

1) Development took place from the community, on the basis of active collaboration between institutional resources and community resources.
2) A community corporation was developed which has the power to buy, sell, and manage.
3) This agency is the contracting agency for this Spring Garden Community Services Center and has a board of directors, of whom almost two-thirds are community residents.
4) The "model" of development of this community can be followed in any number of other communities in which the community-institutional alliance can be formed.

The medical service component of the community health services center had grown to a point of service to 1,000 patients monthly, prior to availability of any federal funding. The service provided represents the combined effort of the Department of Community Medicine, with back-up support of medical and surgical resources at Hahnemann; the Department of Pediatrics through its Children and Youth Programs; and the Department of Obstetrics and Gynecology through its Maternal and Infant Care Program. This same model of collaborative health care institutional effort can be utilized in the development of any number of community service centers.

Because of the success of the Spring Garden program and its acceptance by the people of the Spring Garden community, a similar effort is being launched in an adjacent community, the West Poplar area of North Philadelphia. Another building has been obtained, the architectural planning has been accomplished, and funds are being raised for its renovation. A third neighborhood health center is scheduled to be developed in the Fairmount area, immediately to our north, by the City Health Department. The back-up resources for this center will have to be provided by Hahnemann. The Health Center of the Sixth Health District hopes soon to develop a comprehensive program of health care. Again, the back-up services for this function will have to be provided by Hahnemann.

At the same time that this community-service-center type of comprehensive health care activities is developing, the two principal community hospitals in the area are considering their roles in relationship to this new direction of service. Each of these institutions must make its own decisions for the future, and certainly Hahnemann cannot presume either to speak for them or to make predictions concerning them. It is important to note here only that the steps have been taken to establish a dialogue among the health care institutions in the area.

Because of these developments, Hahnemann must take a vigorous approach towards development of its ambulatory care services.

The implications of this entire development for medical care organization in general, and for medical education for all the health care professions are substantial. We will not go into this matter further at the moment, except to emphasize the obvious point that we are involved with other institutions of the health care establishment in the development of new directions in health care and health education in the United States.

SPAT, CLUTCH, AND MSX: THE BIOLOGY OF DELAWARE OYSTERS

From 1946 to 1956 4.5 million bushels of seed oysters and shells were harvested from the seed beds. No significant amount of shells has ever been replaced. This had significant results since oyster spat (the tiny, free-swimming larva) requires shell for attachment and growh.

In 1957, some 225,000 bushels of seed oysters from Virginia were purchased because of a lack of available seed oysters in Delaware. These oysters probably introduced the MSX disease to Delaware oysters, which virtually annihilated the Delaware oyster industry. This probably would not have occurred if shells had been replaced on these seed beds to provide the needed seed oysters to the leased beds.

In 1963, $150,000 was used to purchase and cultivate existing seed oyster beds. In June of 1965, seed oysters were removed from seed beds for the first time in ten years. Oystermen transplanted 30,000 bushels to their leased beds, but 60 per cent died because of MSX.

In 1970, seed beds were opened again, and 20,000 bushels were transplanted to leased beds. We estimate 60,000 bushels will be harvested this year at a value of $250,000. However, these oysters are being processed in New Jersey plants, and the shell is not available for the Delaware beds.

Our present monitoring of spat counts and oyster growth indicates a phenomenal production and growth are occurring. Since the oysters are now considered at a minimum level for survival of their species in Delaware Bay and the resulting Delaware oyster industry, and since this reproductive potential is considered at an optimum, clutch (shell) will be the limiting factor for the oyster industry. This is why it is imperative to replace the tremendous amount of oyster shell on the seed beds not only to provide clutch for oysters but to rejuvenate the oyster industry.

Approximately 500,000 bushels of oyster shells will be acquired to recover 300 acres of oyster bottoms upon, or adjacent to, existing state-owned seed-oyster beds.

Austin Heller, Secretary of the Department of Natural Resources and Environmental Control, State of Delaware

THE EXPECTATIONS OF LABOR IN THE FIELD OF MEDICAL CARE DELIVERY AND FINANCING

• **Labor expects a national health insurance program to be enacted in a few years with a decline in fee-for-service financing.**

Thomas J. Moore, Jr.

The subject of health care costs and quality is one that helps us knock down the jurisdictional barriers that typically divide labor. In this case, when the men get together they park their weapons outside the door because they have a common enemy. There is a rapidly growing movement among consumer organizations to address themselves to the health industry in an organized fashion. To understand labor's expectations in the health financing and delivery systems you first have to understand how we view the health industry as it operates today. The fastest way to give you that view is to draw an analogy.

Education vs Medical Care

Suppose for a moment that in this society we got our educational services the same way we get our health care: instead of going to a school where teachers and other professionals are coordinated in their efforts, we would have to go shopping around the neighborhood. We would find a history teacher here, an English teacher there, and a math teacher somewhere else. Most of them, if they were organized like modern medicine, would have individual offices, support a staff, buy movie projectors, tape recorders and other modern teaching equipment, and each time we would have a lesson we would pay a fee depending upon the length of the lesson, and on whether or not we got a reading test or a history test. Out of all this, we would piece together an education, trying to coordinate all the training, trying to get the history teacher to pass out his observations of our work to the English teacher, and so on. This is absurd, of course, and no democratic society would tolerate very long an educational system operated that way, for that educational system would be useful only to an aristocracy. We started getting rid of that kind of education more than 600 years ago with the development of classrooms, schools and universities. That is, however, essentially the way in which we get our medical services today in this country. We just go shopping around hoping that the doctor we see knows what he is doing, hoping that the hospital we enter is run by civilized people, hoping that the laboratory that analyzes our blood is run by competent people, and hoping against hope that then we can afford to pay the mysterious bills that arrive after our insurance companies' equally mysterious checks have been sent.

We have no quality guidelines to follow so that we can choose a good doctor from an incompetent one. If we are fairly sophisticated patients, we can get a general practitioner who will cooperate with an internist who will cooperate with a urologist who will transfer our records and, with a little luck, we can piece together a medical care system for ourselves and our families. But it takes a lot of luck and a lot of money, and most of us don't have enough of either.

Now there are exceptions to this, of course. There are multi-specialty group practices where people can enter something that resembles a unified system of professionals working together to overcome health problems. There are even a few such groups that try preventing illness and maintaining health

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Dr. Moore is Executive Director, California Council for Health Plan Alternatives.

at a reasonable level. But for the most part, medical care in America is dispensed with the same graceless chaos that characterizes our used-car industry.

Labor's Expectations

What we expect is that some systematic effort will be made to provide health care in this country. We don't want to put every doctor in uniform or on salary, but we simply must find a way to bring some order into this muddle of waste and jurisdictional disputes and lack of quality controls. Most of all, we want an orderly and peaceful change in the way we get health services, so that we are no longer treated as a commodity in a medical marketplace.

As for health care financing, our expectations are very simple. We expect a national health insurance program to be enacted in a very few years, and we expect a steady decline in fee-for-service financing and a rapid move toward prepayment systems, where our public benefits can be used to obtain care from more organized delivery systems.

We are looking for a health system that does not allow the rural and urban poor to go without even the elemental forms of care. Too frequently people in labor are regarded as having the income and the job security and protection of the plumbers or the teamsters. The fact is that the bulk of our membership is made up of what has to be described as the working poor. They are people with minimal incomes that work full time, support families, try to educate their children on very, very skimpy incomes. They are the people who clean your tables in restaurants, wash your dishes, drive the buses, the people who maintain your institutions. They don't make a lot of money. They are poor people. Many of them live just above the poverty line. They are not equipped in any way to meet the financial demands of modern health care. The only difference between them and the people on welfare is employment, and that's not much difference. Our expectations are for some form of change so that health care moves out of the market place, out of this laissez-faire economic structure that we have created and into the form of basic social and political responsibility.

This is an adaptation of a paper originally presented at the Regional Meeting of the American Society of Internal Medicine, Scottsdale, Arizonia, October 1970 and published in the December issue of *The Internist.*

"Besides state aid, foundation grants, and philanthropic donations, does anyone know how we can raise a few bucks?"

Special Reports

THE TEACHING OF CLINICAL MEDICINE AND THE COMMUNITY HOSPITAL

Education in clinical medicine requires an environment of excellent medical care, and the teacher should place as much emphasis on logic as on technique. These requirements are rarely challenged, but the question is "Where can we find the proper setting to meet them?"

Traditionally medical schools have associated themselves with good hospitals for the purpose of producing a bedside teaching environment. Formerly a teaching hospital and a good non-teaching hospital were similar except for the presence of students. Both had a hierarchy headed by an attending physician in charge who worked intimately with various levels of house staff to form a pyramidal patient care team. In a teaching hospital, students were added to the base of the pyramid.

Gradually this pattern is being eroded by an evolving resistance to the authority of experience *per se*. Today the successful medical teacher must be prepared to defend his precepts to irreverent, questioning, and scientifically sophisticated pupils. He must have a superior mastery of the practice of medicine, and be able to guide the students' use of the library, laboratory, and pharmacy as resources for the management of sick people. Above all, he must impart to the student a keen sense of commitment to patient care, and a responsible, humanistic approach.

In a modern university medical center students are exposed to a large, sometimes bewildering array of medical talent; each patient is the focus of many and varied interests. While patient care is usually excellent, the process of management is obscure to the students. A tendency to select patients for admission because of teaching and research interests provides dramatic clinical material which would make for good teaching if the students could take part in the thinking as well as the action, but they can't. The students need mature guidance, but in the university setting they have only distant contact with the senior staff physicians who relate more closely to the collateral staff such as research and training fellows. All of the latter take priority over the students.

How do the students fare in this storehouse of medical riches? The brilliant student, if he is also aggressive, does very well indeed. He may impose his own personality and even dominate the lower echelons. He uses the array of academic talent intensively and the large amount of exotic clinical material satisfies his voracious appetite for learning. This student is the exception. The less gifted student may wander into any of several unrewarding byways. He may attempt to attain identity and individuality by cultivating the interests of an important faculty member, hopefully someone in a position to influence his scholastic record. By this means, he may end up with an attractive academic record, but little knowledge of patient care or clinical medicine. Another student may lose himself in the anonymity of the crowd. By not treading on anyone's toes he hopes to escape notice and receive a satisfactory grade. Perhaps most commonly, we find a conscientious, hardworking student learning whatever he can from interns and his own reading. The value of intern teaching is, however, limited. It can easily become a form of self-perpetuating mediocrity because the intern himself has just escaped from the same system. On the other hand, reading medical literature alone without mature direction and practical application is unprofitable.

In contrast to the university setting, the good community hospital affiliated with a medical school has a smaller staff dedicated primarily to patient care. In the best of such institutions the staff is well informed about even the most recent modalities of acceptable patient care, and most of the staff are firmly committed to medical practice. Physicians with demonstrated teaching abilities have priority for staff appointments. Many have research interests supported by the hospital. These interests, while not primary activities, help maintain an academic environment. The students have intimate daily contact with their teachers who make rounds, preside at conferences and present lectures and tutorial sessions. As tutors, the senior staff advises students on their reading habits, and assures a well-rounded humanistic as well as scientific approach to medicine.

Emerging from these observations is the concept that for most students, the regular clinical clerkship is best served in a hospital where the major effort is patient care and community health. These responsibilities are served by the superior community hospital, but could they be served by the university hospital as well? Probably not.

Why, then, do universities continue to enter fields of community medicine, routine clinical teaching, and patient care? For one thing it is now a matter of fiscal survival since their former support from outside sources of research funds have withered alarmingly and the delivery of medical care is the current Cinderella. But this is no a valid solution to a teaching problem. The medical schools should continue to provide an academic environment for medical scientists, and the medical school hospitals should offer undergraduate and postgraduate training in research and specialty subjects. In the university setting, medical treatment should be innovative and research oriented. However, the delivery of standard high quality medical care and experimental approaches to new methods of providing this care should be the domain of the community hospital, and therefore the basic clinical clerkships should be in these hospitals. The students should have contact with both the university center and the community hospital throughout their medical course, and those members of the affiliated hospital staff who take part in teaching should meet all the standards of excellence expected of other medical school faculty except that research production cannot have the same emphasis as in the university hospital. The curriculum should be supervised by a partnership of medical school in-house faculty, affiliated hospital staff, trustees, and students.

I include the trustees because, as the ultimate governing body of the hospital, they have a responsibility for all that happens within the hospital. Responsibility cannot be delegated. The trustees can and should assign responsibility to their hospital staff for making recommendations about curriculum; and if they are wise trustees, they will undoubtedly endorse the recommendations made by their staff. However, they still have the ultimate responsibility, and to be intelligent trustees they should take an active part in the process of developing the recommendations which they are going to approve. I believe that these principles apply to all phases of hospital management as well as to the management of any other institution for that matter.

While it is unlikely that the trustees would recommend subjects for inclusion in a curriculum, or discuss teaching methods, it is, on the other hand, quite possible that they would have to choose among options when budgetary constraints preclude carrying out the entire program recommended by the curriculum committee. Or, if they leave the choice to the staff, they still have to establish the budgetary constraints. In performing the latter function they must know something about what their costs are for, and how effective the program will be in relation to its cost.

The students, on the other hand, should participate in curriculum affairs not because they are responsible for them, or have decision-making authority, but because they provide an important resource for getting feedback about the effectiveness of a curriculum. While the teacher should not abdicate his responsibility for curriculum decision, he

Continued on next page

Deaths

DR. WILLIAM MARSHALL, JR.

Dr. William Marshall, Jr. of Milford died on September 9, 1971, at age 90. He had practiced medicine for 67 years, retiring shortly before his death.

Dr. Marshall was born in Milford and attended the former Delaware College. He received his medical degree from the University of Pennsylvania School of Medicine, and then interned at the former Delaware Hospital. In 1906 he entered partnership practice with his father, Dr. George William Marshall, and they were later joined in practice by his brother, Dr. Samuel M. D. Marshall.

Dr. Marshall and his mother started the first hospital in Milford, the Marshall Hospital, which later became part of the Milford Emergency Hospital. He was also a co-founder of the Delaware Anti-Tuberculosis Society. He also served on the State Board of Health, and was on the examining board for new physicians for 26 years.

Dr. Marshall served with the Delaware National Guard on the Mexican Border. He served in World War I as a Major in the Medical Corps with the 1st Delaware Infantry. He joined the American Legion when it was founded in France, and was a charter member of it. He also was the first Scoutmaster for Boy Scouts in Delaware.

He belonged to the Kent County Medical Society and the Medical Society of Delaware, serving as president of the society during World War II.

Dr. Marshall is survived by his wife, Mrs. Rosanna Bowser Marshall, who had served with him as superintendent of nurses at the Marshall Hospital.

DR. JOHN F. HYNES

Dr. John F. Hynes died on September 18, 1971, at the age of 64, after a short illness.

Dr. Hynes was born in New Haven, Connecticut, received his medical degree from Yale University School of Medicine, and came to Delaware in 1935. He served as a resident in the Carpenter Clinic and became director in 1936, serving until 1952. At the time of his death he was chief of Oncology at St. Francis Hospital.

During his years of service at the Carpenter Clinic of the Memorial Hospital he became widely known as an authority on lymphomas and Hodgkin's disease. He presented several papers on the subjects to national and international medical meetings.

He was a member of the AMA, the American College of Surgeons, the American Radium Society and the James Ewing Society, the American Cancer Society, and the State and County Medical Societies. He was a member of the Board of Directors of the American College of Radiology.

Dr. Hynes is survived by his wife, Mrs. Martha Kreer Hynes; his mother, Mrs. Mary Louise Hynes; four sons, Wiliam J., Robert A., David P., and John F. Jr.; two daughters, Mrs. Joan F. Mitchell, and Miss Mary L. Hynes; a brother, Dr. Thomas V. Hynes; and nine grandchildren. All survivors live in Wilmington.

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SPECIAL REPORT

Continued from page 274

should recognize that, properly interpreted and applied, student opinion can be useful. For this reason students are accepting increasing participation in the formation of curriculum policy although very few good teachers would care to delegate authority for decisions to the students.

Frank D. Gray, Jr., M.D.

Dr. Gray is Professor of Medicine and Director, Division of Medicine, The Lankenau Hospital, Philadelphia.

This paper in a somewhat different form appeared in the August 1970 issue of *Medical Counterpoint* under the title, *Who Should Teach Clinical Medicine?*

Highlights

KIDNEY TRANSPLANTATION:

A Progress Report

LEE W. HENDERSON, M.D. — *Associate Professor of Medicine, Director of Dialysis and Transplant, University of Pennsylvania. Presented to the Tuesday Morning Medical Conference, WMC, July 13, 1971.*

The National Transplant Registry for renal transplants now numbers more than 3,000 kidney transplants in the United States. An evaluation of current practice and results reveals that at this time renal transplantation is a competitive therapeutic modality with dialysis for the treatment of renal failure. Despite the registry, which has been instituted only relatively recently, the long-term (over five years) survival statistics are somewhat shaky because of the small number of transplants performed in the beginning. It is widely apparent to those experienced in both forms of treatment that, in addition to time of survival, the quality of life with a good transplant is better than that achieved with the best dialysis success.

This improved quality is due to several factors. Dialysis requires six hours, three times a week, either in a hospital facility or on a home dialysis program. The dialysis patient must follow a diet restricted in protein and potassium and, more troublesome, restrict total fluids, the consequential thirst often being an onerous part of the regimen for the patient. Largely because of their anemia, dialysis patients' energy reserves are limited; manual labor for a living is out of the question. On the other hand, successful transplants have normal energy, and their physical activities need be restricted only to the avoidance of such activities that might physically jeopardize the transplanted kidney. The risk of trauma to the kidney is greater than normal since the transplant is placed more superficially than the normal *in situ* organ. Although the first year expenses are similar, the day-to-day and week-to-week expenses of the two programs are very different; chronic dialysis is much more expensive.

First year survival of a series of 300 dialysis patients was 87%; this decreased approximately 10% per year, reaching around 50% at five years, the end of the study period. The survival of transplanted kidneys varies with the quality of the "transplant merchandise," ie, the donor source: 10-15% of kidneys donated by immediate blood relatives fail to survive the first year as contrasted with about 50-55% failure of kidneys from cadaver or other non-related donor sources.

The choice of donors for kidney transplant involves many moral and ethical considerations. In general, volunteers for kidney transplant from outside the family must be suspect as unbalanced individuals; it cannot be considered a "normal" action to volunteer to donate a vital organ in a procedure which carries a definite immediate risk of morbidity and mortality as well as a not completely predictable long-term implication. Although purchase of a kidney has been made at least once, the legal and moral implications involved with the sale of a vital organ and an intrinsically dangerous procedure make it very unlikely that this will ever be a significant source of kidneys.

The long-term survival of live related donor kidneys has been greatly increased with increased expertise. At the present time, a 70% five-year survival can be expected compared with a 50% dialysis five-year figure. (It should be remembered that the 70% estimate is a five-year kidney survival figure, not patient survival, since patients in whom a transplanted kidney fails may receive another transplant or be placed on dialysis.) Comparable survival figures for unrelated donors are less, being 45-50% at one year with a decline at two years to 40%, which remains about the same at five years. Unrelated kidney transplant survival is thus approximately equal to dialysis at five years. Thus, the epigram that "dialysis is the 'thinking man's filter' "—a stopgap while waiting or considering for a kidney transplant — is no longer so. The mortality figures have by their equalization become competitive: although the artificial kidney provides better early survival, it can be expected to last less long.

Although 98% of monozygous twin transplants are functioning at the end of one year, by five years this has declined to 60%, largely because of the development in the transplanted kidney of the same renal disease which affected the recipient's kidneys originally (eg, glomerulonephritis).

In addition to tissue compatibility, there are several criteria which must be met in the selection of kidney donors. As a general rule, donors should be under 65 years, for after that sclerotic intrarenal vascular changes are apt to be too severe. Donors should generally be in robust good health, free of any systemic disease, and judged emotionally able to give without coercion. Coercion or misleading of donors is always to be avoided. In all states but Massachusetts there are no legal mechanisms to permit the use of minors as donors.

Actuarial estimates indicate that although there is a slight decrease in life expectancy after nephrectomy, it is so small as not to require prorating of life insurance, being comparable to the risk involved in daily commuting 14 miles on a busy highway.

Recent new definitions of death (isoelectric EEG in the absence of drugs for 48 hours with absent eye motions in response to caloric stimulation of the middle ear and no respiration without mechanical support) are relevant to the obtaining of suitable cadaveric material, which is usully consequent to brain injury, traumatic or spontaneous cerebral hemorrhage. Transplant teams can remove a cadaver kidney from the site of demise to the transplant center, but, in general, the removal of the kidney for immediate transplant in an operating room situation is preferable, if at all possible. ABO compatibility is of prime importance; crossmatch of donor lymphocytes against recipient plasma has done much to eliminate acute hyper-rejections of transplanted kidneys.

There is still controversy regarding the importance of lymphocyte typing using the HLA system popularized by Dr. Paul Terasaki. It seems at the present time that HLA typing is especially valuable for choosing the best donor within a family of several potential donors, but not useful in categorizing cadaver matches.

Locally there are several transplanting institutions: the University of Pennsylvania, Albert Einstein Medical Center, and, until recently, Hahnemann Hospital. The University of Pennsylvania has an 80% one-year survival figure for live related transplants performed with antilymphocyte globulin (ALG). ALG is a major contribution to immunosuppressive therapy and permits lower doses of prednisone and Imuran to be used. Death from infection is consequently lower in ALG-treated transplant recipients. While live related donor transplant remains the most succesful, the development of ALG has encouraged our group to increase our cadaver donor transplant program.

The Greater Delaware Valley Regional Program sponsors a kidney transplant program for this area. Donors as well as patient candidates are solicited; further information is available in a brochure which may be obtained from the GDVRMP or from the Medical Society of Delaware.

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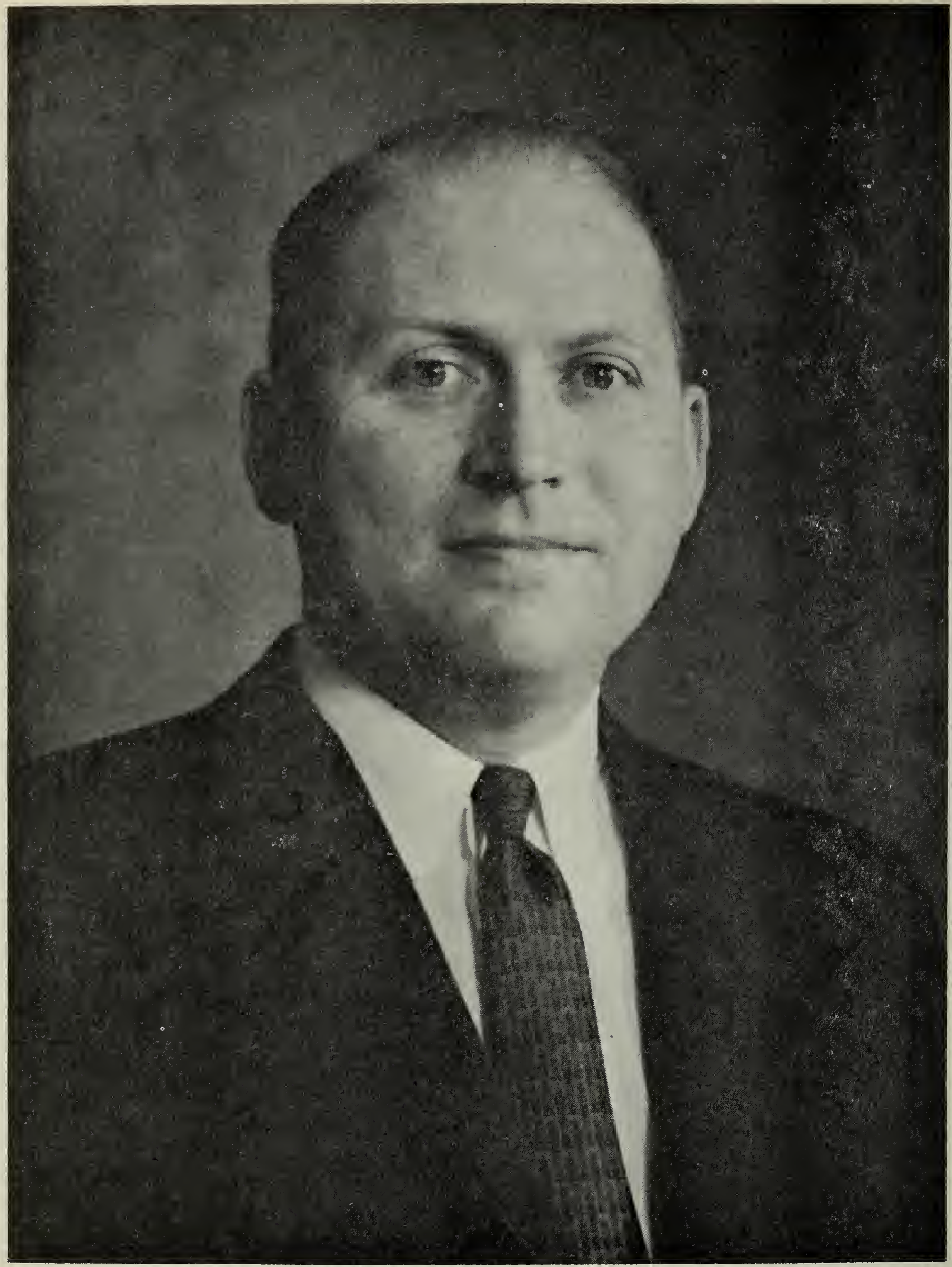
THE CONCERN OF ALL THE PEOPLE

Medicine should be recognized as a meeting ground of all the sciences and all the arts. It adds to and takes from all areas of human endeavor. It is involved in every aspect of human life. Medicine is the concern of all of the people, whether they need its help or not.

Ward Darley, M.D.
Formerly Executive Director of the Association of American Medical Colleges



HERBERT M. BAGANZ, M.D.

President, Medical Society of Delaware, 1971-1972

President's Page

CHANGING PATTERNS OF MEDICAL PRACTICE

The practice of medicine cannot be expected to progress and excel without constant change. Our medical *system* is varied and complex, but it is a *system* that is undergoing extension and evolutionary changes. We, the physicians of Delaware, are showing qualitative and quantitative gains as we meet the increasing public demands for medical services through our own initiative. Individual physician contributions of effort are still needed. The changing pattern needs to include a strong, effective, vocal and representative body of organized medicine such as the Medical Society of Delaware. We have, additionally, opportunities for local initiative and innovation with the physician planning along with other individuals and agencies through the Partnership for Health Act of the Regional Medical Program and the Comprehensive Health Planning Law. Health care is becoming a basic human right in the evolutionary process, but there must be a willingness to accept something less than the best at times for the sake of moving in a proper direction.

Changing patterns of medical practice are noted to be occurring in six areas: alteration and encouragement of primary medical care; increased centralization of services; use of more health manpower; increased emphasis on continuing education; pressures on income arrangements; and more emphasis and responsibility for peer activities.

Primary care that is delivered with efficiency, dignity, convenience, and economy can doubtfully be continued under our present system. The conscientious first-line physician is faced with an intolerable load. Solo practice in primary care can be foreseen to be fading with replacement by group arrangements as a mechanism for primary care with responsibility by teams of health workers working in ambulatory health centers. Primary physicians with preparation and training in internal medicine, pediatrics, psychiatry, emergency care, along with knowledge of techniques of administrative management and supported by a staff of non-physician health workers are evolving. These physicians then can spend more of their time making medical decisions and judgements while providing supervision and direction to these workers on their health team. The present training programs of the specialty of Family Practice alone cannot be expected to adequately fulfill the public demand for delivery of primary health care service.

Centralization in ambulatory health centers and group practice will relieve some of the mal-distribution of medical services with the necessary incentives to the public and the physicians associated with necessary support of administrative and manpower services. Ambulatory centers and group practices will serve as easily accessible entry points for multi-disciplinary health care with a decrease in the fragmentation of health services. The voluntary medical system must be centered around the community and its needs rather than the physician and his interests. This is a compromise of some of the physician's independence, but this is consistent with the free enterprise system. There is hope in Delaware for new mechanisms for administrative talent and funding with the balance of physician influence in this coalition. The specifics of whether a fee-for-service payment is changed to prepaid capitation, or the existence of a Foundation are not an essential to this pattern of change. There is increased emphasis on preventive medicine and structuring of ambulatory services. Hospitals as social institutions with their priorities and goals do require more physician professionals who can contribute to the efficiency of their operation. A change from the volunteer system of physicians in hospitals is noted with the necessity for more physicians in managerial and educational functions. Administrators of institutions of health care are showing increased knowledge and involvement in community resources and needs.

Health manpower needs have significantly increased, including the need for more physicians. A better utilization of physicians' skills in non-manipulative procedures will increase productivity. Allied health personnel are becoming available with satisfactory programmed training and are increasing the physician productivity with preservation of quality of care. The future needs for physicians in Delaware, based on existing demands on services now rendered, are difficult to determine considering known and unknown unmet needs, the effects of medical engineering and technology, and the expected entry of individuals not now regularly involved into the system of medical practice.

Continuing education is of increasing importance as an effort towards assuring our continued competence. Accreditation for continuing education should remain a voluntary effort. There are many new excellent audio-visual techniques and programs that increase the availability of educational materials to add to the clinics, conferences, courses, and meetings.

There is an increasing lack of freedom in the establishment of value of services. We have come a long way from altering fees for patients with varying income levels; but we need to continue to be cautious of delegating our fee control to regulatory agencies and third parties, and to remain fiscally responsible to ourselves and the public. Financial rewards to physicians are still an honorable incentive in our free society.

Patterns of practice are now and will be more accurately evaluated by data accumulating programs of peer review. A more uniform state-wide, ongoing, effective peer review activity with standards established by peers and reviewed by peer groups is desirable to educate and to alter certain patterns of medical practice.

H. M. Baganz

PROGRESS VS PRIMITIVISM: OUR PARADOX

The world is a paradox of technological progressiveness and social primitivism. For several decades we have had the technological capability to destroy civilization in a few minutes, so great and quick is the nuclear energy we can release. But during this time we have been unable to build a socio-political system to preclude this from being a serious threat. An unsophisticated observer from a less advanced planet might expect that with so tremendously powerful a force in our possession, we could and would employ it with high priority for peaceful uses. Nuclear scientists have told us — years ago, in fact — that by the controlled release of nuclear energy we could move mountains, change the course of rivers, ultimately even influence weather and generally make the earth's surface and its total resources more readily available for this planet's inhabitants. We have been unable, for social and political reasons, to arrange for more than a preliminary, token effort in these directions.

from Simon Ramo, Ph.D., Cure for Chaos

Editorials

MY CUP RUNNETH OVER

The ever growing demands upon the time of the physician, nurse, emergency room, and laboratory service compel us "directors of the show," to expedite the administration of efficient care to patients, not only to conserve needed services and agencies, but to provide effective patient treatment. We have been quick to add expensive mechanical aids to the delivery of medical care but have often lost sight of the simple procedures that ensnare us.

The urinalysis is a case in point. What value is the routine, voided urine specimen of the female patient? Very little. What meaning can ordinarily be derived from "five to six WBC's per HPF" or "fifty to sixty WBC's per HPF" or "RBC's too numerous to count"? None at all. "Five to six RBC's" may indicate either a urinary tract infection or just as likely, a specimen contaminated by vaginal secretions. RBC's too numerous to count may indicate the presence of a ureteral calculus or a specimen inundated by menstrual blood. How frequently is a doctor called to the emergency room to see a female patient with abdominal pain, whose "routine lab work" has included a urinalysis, complete with the confusion of a meaningless urinary sediment? To collect a valid specimen, the nurse must at that point wash the patient's perineum for a "clean catch, midstream, voided urinary specimen," if the patient has the ability to void again, which she usually (too often) cannot do because her last drop of urine was expended in the meaningless "routine urinalysis." All must wait while she primes her bladder for another attempt and after receiving the new, clean, specimen, the overtaxed laboratory technician must then repeat a urinalysis. It is now 2 a.m.

How much simpler and less costly of money and effort it would be for all concerned, including the unhappy patient, if the first urinalysis had been performed on a clean catch, midstream, voided urinary specimen. Why shouldn't this procedure replace our current routine?

We are truly creatures (prisoners) of our habits. We long for the sophisticated telecardiographic analysis of the patient's heart pattern, but forget the simplest procedures that may really save time. We are penny wise and dollar foolish.

C.I.G.

* * *

REEVALUATING PRACTICE HABITS: CYSTOSCOPY

Medical costs have continued to soar, and this, plus ethical considerations, should prompt us to a continuing reevaluation of our practice habits. In October 1970 the *Delaware Medical Journal* published an excellent article by Dr. John M. Levinson, showing the value and safety of outpatient GYN surgery in selected cases. The real saving in money, physician's time, and hospital usage by performing such procedures in the outpatient department cannot be ignored. But there are many commonly performed surgical procedures and diagnostic tests which are not necessary.

We must continuously attempt to balance the possible gain of a procedure against its risks and costs. With the constant push of a demanding patient load, organizational demand on our time, and propaganda about "incomplete study" of patients leading to law suits, we are pressed to take the easy way out. It often seems easier to request a complete survey or diagnostic "work-up" on a patient than to take the few extra minutes needed to determine whether or not the study will really contribute to the diagnosis or treatment.

A case in point is the use of diagnostic cystoscopy. The mere presence of urinary symptoms, urine abnormalities, or urinary infections should not automatically signal a request for a urologic consultation or the performance of cystoscopic examination. No one would question the advisability of cystoscopy in a middle-aged male with gross, total, painless hematuria. We should question, however, the necessity of cystoscopy in the case of a young female with hematuria accompanying an acute documented episode of urinary infection. A few minutes' extra time spent taking a more careful history and in careful follow-up urinalyses and cultures can easily avoid unnecessary cystoscopic examinations. Diagnostic cystoscopy is rarely helpful in the investigation of any urinary infection unless it should become necessary to determine whether the infection is confined to the bladder or whether renal urine cultures are also positive.

Cystoscopy itself is usually an undramatic, simple procedure consuming only some fifteen minutes' time. It also consumes some $160 to $200 of the patient's money. In order to be justified, cystoscopic examinations should have a reasonable chance and necessity of revealing disease or ruling out disease. Good quality medicine does not require cystoscopy for most urinary complaints or urinalysis abnormalities. Let us beware of repeated cystoscopies and of "routine" cystoscopies done purely for urinary infection, for enuresis alone, or for vague urinary symptoms.

We cannot as individuals cope with the abstract term "high cost of medical care," but we can cope with individual situations and reduce the number of unnecessary cystoscopies.

J.H.F.

* * *

CLEANING MEDICAL RECORDS WITH S-O-A-P

No one who's ever tried to read other doctors' notes (or for that matter, his own when they are more than a year old) will deny that the traditionally organized medical record is a mess. Recently a charismatic advocate for reorganization of medical records has arisen: Dr. Lawrence Weed, now at the University of Vermont.[1,2] Dogmatic and doctrinaire as befits a prophet, Dr. Weed has many disciples, including the undersigned.[3-7]

Two fundamental concepts of Dr. Weed's startlingly simple system are *The Problem List* and the *S-O-A-P note.* Each patient's medical records should carry as a face sheet his list of problems, dated and subdivided into *active* and *inactive. All* of the patient's problems should be listed at the level of specificity attained (example: *headache,* to be updated to *tension headache* or to *brain tumor* as the picture clarifies). Alcoholic husband, child with cerebral palsy, 4th grade education, divorced three times — these are all problems as well as hysterectomy for fibroids, and TBC in childhood.

All progress notes are prefaced by the problem number to which they refer and the note itself appears in the S-O-A-P format: first, subjective (the patient's complaints), then objective (the doctor's observations including any significant negative or positive laboratory reports), then assessment (the doctor's opinion of the patient's clinical status, progress or lack thereof) and then plan (all orders, treatment, etc.). *S*ubjective, *O*bjective, *A*ssessment, *P*lan; ergo, S-O-A-P.

Most medical schools are now teaching the problem oriented record to their students. In our community, the Department of Medicine of the Wilmington Medical Center has recently inaugurated the POR (problem oriented record) on its inpatient service and will soon be using S-O-A-P to clean up its OPD notes. The new Department of Family Practice is problem oriented as is SMAC (the Southbridge Medical Activities Center). The Department of Pediatrics is also contemplating S-O-A-P, and we hope there will soon be a lather of enthusiasm in the other major clinical departments.

Many private physicians have told us they are S-O-A-Ping their records and making problem lists if only to avoid the embarrassment of saying, "How are your periods?" to a patient whose uterus was removed on the same physician's advice, or "Let's get a barium enema," three months after one has already been obtained but buried in the record.

The POR makes for better patient care and more rational physician management and thus for better patient care. The POR makes sense. Most medical records are a morass; retrieving the information they contain is seldom easy, often impossible, always excessively time consuming. The POR, The Problem List, and S-O-A-P can help.

B.Z.P.

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OF CARTS, HORSES, AND ER VISITS

The Health Planning Council of Delaware has recently issued a review of the inpatient and outpatient emergency room use of Delaware's hospitals during the last five years. (Table 1)

It is interesting to note that the total patient days as inpatients almost equal the total population of the individual counties: one patient day per county resident, more or less. Emergency room visits in 1970 totaled about one-fourth of the population in New Castle County in 1967 and did not appreciably change in 1970, the two years compared in the table. However, the visits relative to population in Kent have jumped 64% in the past three years and now represent a number equal to more than half of the population. The jump in visits in Sussex County is 79% although the visits relative to population are still the same as in New Castle County, about one visit per four citizens.

We are sure that all these emergency room figures reflect to a large extent the amount of private physician care available. The increase in emergency room visits in Kent and Sussex County reflects the unavailability of private

TABLE I *
POPULATION OF DELAWARE

	1967	1970†	% Inc. or (Dec.) 1967 vs 1970
New Castle County	366,298	386,215	5.4
Kent County	81,530	78,204	(4.1)
Sussex County	78,586	78,560	0.0
DELAWARE TOTAL	526,414	542,979	3.1

† 1970 Population figures are preliminary

TOTAL PATIENT DAYS
1967 vs 1970

	1967	1970	% Inc. or (Dec.) 1967 vs 1970
New Castle County	339,185	380,128	12.0
Kent County	73,587	77,055	5.0
Sussex County	—	72,061	—
DELAWARE TOTAL	—	529,244	—

EMERGENCY ROOM VISITS
1967 vs 1970

	1967	1970	% Inc. or (Dec.) 1967 vs 1970
New Castle County	90,288	96,466	7.0
Kent County	18,478	30,296	64.0
Sussex County	10,431	18,632	79.0
DELAWARE TOTAL	119,197	145,394	22.0

*This is Table XI in the Annual Utilization Review, Health Planning Council, February 1971.

medical care of a non-emergency nature to their citizens, especially those of low-incomes. At a time when the problem of financing care for those who cannot afford it is under constant discussion, we think these figures attest the necessity of considering the problem of the manpower to deliver the care. There is a Greek proverb which speaks to the danger of inviting too large a number of guests for the host to handle hospitably. In our opinion, the manpower problem in certain aspects of medical care, particularly so-called minor medical care or primary care, is more critical than the money problem. And to proverbalize a bit further, it's silly to buy a cart if you haven't got a horse to pull it.

B.Z.P.

* * *

RIFAMPIN

Rifampin* (formerly known as rifampicin) is a new semi-synthetic antibiotic belonging to the rifamycin group of antibiotics, derived from *Streptomyces mediterranei.* Antibiotics of the rifamycin group have been used extensively in Europe and South America as broad spectrum antibiotics and in the treatment of tuberculosis. The introduction of rifampin in the United States presents a unique situation in that while rifampin has broad spectrum potential its use is being restricted to the treatment of tuberculosis and in eradication of the meningococcus carrier state.

Rifampin shows *in vitro* effectiveness against gram-positive and gram-negative bactéria, typical and atypical strains of mycobacteria and some viruses. Rifampin's antibacterial activity is due to inhibition of RNA synthesis, and this antibiotic is probably bactericidal in action depending upon the concentration of antibiotic present at any one time.

Rifampicin has been studied extensively in this country and abroad in the treatment of pulmonary tuberculosis, and it appears to be an excellent adjunct to therapy with isoniazid or ethambutol or in combination with both of these antituberculous agents. With the availability of rifampin the patient with active pulmonary tuberculosis can be treated with oral therapy alone since streptomycin is not necessary in this regimen. (It should be noted that some observers[1] feel that this lack of requirement for intermittent parenteral therapy may make patient control more difficult.) Rifampin should never be used alone in the treatment of pulmonary tuberculosis as resistance to this antibiotic may develop rapidly.

The second approved use of rifampin is in the treatment of meningococcal carriers. It is important to emphasize that rifampin is not a satisfactory agent for the treatment of meningococcal infections, but should be utilized only for the elimination of the carrier state in population groups who are at high risk for development of meningitis. In controlled studies[2,3] rifampin appeared to be the best agent for control of the carrier state with the possible exception of minocycline (a new tetracycline antibiotic). Since antibacterial resistance to rifampin develops rapidly *in vitro* and *in vivo*, it is speculated that the extensive use of this agent for the control of meningococcal carriers might provoke a high incidence of rifampin-resistant strains of meningococci.

As mentioned above, rifampin has been studied extensively in this conutry and abroad in the treatment of other types of infections. One investigator[4] used a "single dose" of this drug in the treatment of acute gonorrhea and reported clinical and bacteriologic results comparable to those with other oral agents. However, studies[5] carried out at the Wilmington Medical Center suggest that the failure rate with this drug is too high for it to be utilized in the treatment of gonorrhea. Particularly disturbing was the development of rifampin-resistant strains of gonococci *in vivo* following treatment.

Several studies[6,7] evaluating rifampin in the treatment of acute and chronic urinary tract infections were not encouraging since the development of resistant bacteria in patients with chronic infection appeared to be more rapid than with other oral antibacterial agents.

In a limited study[8] rifampin appeared to be a satisfactory agent in the treatment of gram-positive coccal infections of the respiratory tract, but the large number of less toxic agents available for the treatment of such infections

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*Rimactane® — CIBA
Rifadin® — Dow

limits the usefulness of rifampin in this area.

The recommended daily dose of rifampin in pulmonary tuberculosis and meningococcal carriers is 600 mg per day (in children 10-20 mg per kilogram). At this dose side effects from rifampin should be minimal except in patients with severe liver disease.

Congenital abnormalities were noted in experimental animals given extremely high doses of rifampin so the clinician is cautioned to avoid the use of this antibiotic in women at risk of becoming pregnant. Thrombocytopenia and leukopenia have been observed in patients receiving rifampin, and, in fact, the recognition of this effect appeared to be responsible for discontinuing the clinical investigation of the broad-spectrum application of this antibiotic in the United States. There are several gastrointestinal and central nervous system side effects listed in available advertising material. Not mentioned in this literature is the possible effect of rifampin on the auditory mechanism. Some animal investigation suggested eighth nerve damage and one investigator[6] reported transient low frequency hearing defect in two patients given rifampin. However, studies[7] at the Wilmington Medical Center with volunteers on high doses of rifampin failed to show any ototoxicity with careful audiometric testing. In this particular study, six of twelve volunteers complained of extreme drowsiness while receiving 900 mg of rifampin daily for a period of one week.

The practicing physician will have little opportunity to utilize this new antibiotic unless he is involved in the treatment of patients with pulmonary tuberculosis. However, one's interest in this antibiotic group will be maintained by its potential as an antibacterial, antiviral and tntitumor agent.

W.J.H.

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STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

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The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes have not changed during preceding 12 months.

Extent and Nature of Circulation	Average No. copies each issue during preceding 12 months	Actual No. copies of single issue published nearest to filing date
A. Total Number Copies Printed	1010	1010
B. Paid Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	56	74
2. Mail subscriptions	683	688
C. Total Paid Circulation	739	762
D. Free distribution by mail, carrier or other means	195	199
E. Total Distribution	934	961
F. Office use, left-over, unaccounted, spoiled after printing	76	49
G. Total	1010	1010

I certify that the statements made by me above are correct and complete.

ANNE E. SHANE

Delaware Academy of Family Practice

MONTANA DOCTOR TAKES HELM

Dr. J. Jerome Wildgen, a family physician from Kalispell, Montana, became President and Dr. James L. Grobe of Phoenix, Arizona, was named President-Elect of the American Academy of Family Physicians in last-day sessions of the AAFP Congress of Delegates held this month in Miami Beach.

The AAFP, formerly the American Academy of General Practice, is the national association of some 31,000 family doctors. Second largest of the nation's medical groups, it is the only such group to require its members to take continuing education — 150 credit hours every three years. The Academy's four-day Scientific Assembly, held annually immediately following three days of meetings by the Congress, is one means by which Academy members obtain such credit.

Dr. Wildgen, 47-year-old graduate of the University of Kansas School of Medicine, assumed the presidency after a year as President-Elect. He has been a member of the Academy's Board of Directors for three years. Dr. Wildgen is a clinical instructor and preceptor in family medicine at the University of Washington School of Medicine and serves as a consultant in Family Practice to the US Air Force. He is a charter diplomate of the American Board of Family Practice.

Other officers elected by the 1971 Congress are: Dr. A. Alan Fischer, Indianapolis, Indiana, Vice President, and Drs. Carl B. Hall, Charleston, West Virginia; Jack G. Phipps, Wichita, Kansas, and George A. Rowland, Millvile, Pennsylvania, members of the Board of Directors for three-year terms. Drs. James G. Price, Brush, Colorado, and Stanley A. Boyd, Eugene, Oregon, were re-elected Speaker, and Vice Speaker, respectively, of the Congress of Delegates.

Letters to the Editor

To the Editor:

Because of changing conditions, the practice of routine, non-selective vaccination against smallpox should be re-examined.

Today, the risk of complications resulting from smallpox vaccination is greater than the probability of a citizen's contracting the disease. There has not been a case of smallpox in the United States since 1949. However, according to statistics released by the US Public Health Service, nine deaths were associated with smallpox vaccination in 1968; and in the years 1959-1966, an average of 7.5 deaths per year were associated with vaccination. In addition, the smallpox vaccination has a definite risk of untoward reaction.

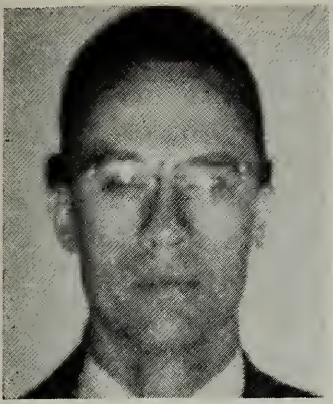
Smallpox could occur in this country only by importation. The probability of such importation is extremely low and continues to decline with the success of the World Health Organization's vaccination program. If an importation of smallpox were to occur, the extent of the disease's spread would most likely be small because this country maintains efficient surveillance and control procedures.

Delaware's Division of Physical Health ceased recommending routine smallpox vaccination in school immunization programs in 1969. In August of this year, the Division terminated the routine vaccination in its Well Child Clinics.

It is hereby recommended that the practice of routine vaccination against smallpox be discontinued. In the future, public health practices should be devoted to assuring adequate immunization of all health service personnel, since these would be the first persons to come in contact with any importation of the disease, and of all travelers to and from continents where smallpox has not been eradicated.

Edward F. Gliwa, M.D., *Deputy Director, Division of Physical Health, Department of Health & Social Services.*

New Members

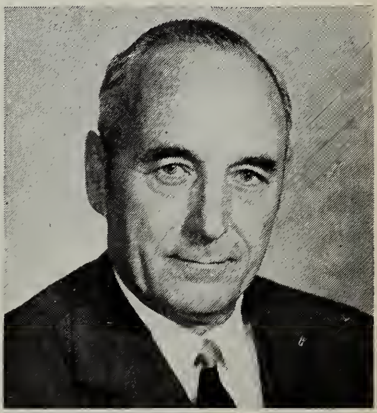


Richard P. Behrendt, M.D., a graduate of the University of Cincinnati College of Medicine, '60, in his native Ohio, is a board-certified anesthesiologist. His internship was served at Swedish Hospital in Seattle and his residency at the University of Washington. Dr. Behrendt was previously in practice in New Jersey. In Wilmington he practices at the Wilmington General Division of the Wilmington Medical Center.

Herman J. Stein, M.D., is Philadelphia-born and Philadelphia-educated. A '62 graduate of the University of Pennsylvania School of Medicine, Dr. Stein served his internship at Pennsylvania Hospital and a residency at the Philadelphia General Hospital. Board-certified in radiology, Dr. Stein works at the Delaware Division, Wilmington Medical Center. He, his wife, and two young children live in Brandywine Hundred, Wilmington. He enjoys boating during his spare time.

James F. Reamer, M.D., Hahnemann Medical College, '61, is a native of Baltimore, Maryland. After an internship at Allentown (Pa.) Hospital, Dr. Reamer served residencies at the University of Kansas and the University of Pittsburgh. Dr. Reamer is a board-certified pathologist practicing at the Wilmington Medical Center. He belongs to the American Society of Clinical Pathologists and the American Society of Cytologists. His interests include skiing and gourmet food and good wine. Dr. and Mrs. Reamer and their three children live in Wilmington.

Jurg A. Schneider, a native of Switzerland, is a graduate of the University of Basle Medical School, '45. Dr. Schneider served two residencies in surgery at the University of Basle and in 1951 became board-certified in surgery in Switzerland. In 1952 he emigrated to the US where he attained citizenship status in 1958. Dr. Schneider is presently the Director of Research, Pharmaceuticals Division, E. I. duPont de Nemours & Company, Wilmington. He is also Adjunct Professor Pharmacology, College of Physicians and Surgeons, Columbia University. Dr. Schneider, his wife, who is also a physician, and their four children reside in Woodbrook.



In Brief

Speakers on ‘Ask the Doctor”

Speakers for November 1971 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: November 2, R. L. Meckelnburg, M.D., *Diagnostic Use of Radioisotopes in Medicine;* November 9, H. H. Stroud, M.D., *Alfred I. duPont Institute;* November 16, Winder Porter, M.D., *Communicable Disease;* November 23, Albert Dworkin, M.D., *Population Control;* November 30, David Levitsky, M.D., *Sore Throats and Bad Hearts.*

In the News

Alfred R. Shands, M.D., of Wilmington, director of the Wilmington Senior Center and medical director emeritus of the Alfred I. duPont Institute and William H. Duncan, M.D., of Wilmington, director of the outpatient department of the Wilmington Medical Center have been appointed delegates by Gov. Russell W. Peterson to participate in the White House Conference on Aging to be held Nov. 28 to Dec. 2.

Memory Transfer

A substance which may enable transfer of a learned memory trait from a conditioned animal to an unconditioned one has been synthesized at Baylor College of Medicine in Houston, Texas.

Dr. Georges Unger, Professor of Pharmacology, said it is the first synthetic substance capable of inducing a specific behavior.

Rodents used in the experiment normally prefer a shadowed environment. When conditioned to stay away from the darkened areas, their preferences change. Once this occurs, scientists have found that they can take a certain chemical extract from the rodent’s brain, inject it into the brain of a normal animal, and it will reverse itself to a fear of the dark. The Baylor scientists who have synthesized this conditioning substance have named it Scotophobin.

Physician Shortage Areas

The AMA supports legislation that would provide federal aid to individual or small groups of physicians in establishing medical practices in rural areas, small towns and low income inner-city areas.

The legislation (S. 2269) would amend the National Housing Act to authorize mortgage insurance for the construction and rehabilitation of medical facilities for the practice of one to four physicians in physician-shortage areas. In 1966, mortgage insurance was authorized for establishment of non-profit group practices. The current legislation would extend that program.

Platform Statement: The AAAIMH

The following statement has been made by the American Association for the Abolition of Involuntary Mental Hospitalization, Inc.:

“Throughout the entire history of psychiatry, involuntary psychiatric interventions and especially involuntary mental hospitalization, have been regarded as morally and professionally legitimate procedures. No group of physicians, lawyers, or social scientists has ever rejected such interventions as contrary to elementary principles of dignity and liberty and hence as morally and professionally illegitimate. The AAAIMH does.”

Thomas S. Szasz, M.D.
Chairman of the Board of Directors

A Vote of Thanks

Increased interest was noted in the annual meeting held in Dover earlier this month. We feel this resulted in part from the Physicians' Art Exhibit (and Spouses') and the Scientific Exhibits presented by physicians. Many thanks go to all who exhibited in either of these categories. Your contributions helped us to have a livelier meeting! Winners in the Art Exhibit were: 1st place, *4th of July*, R. Douglas Sanders, M.D., 2nd place, *Tree*, Alvin Weiner, M.D., 3rd place, *Rented Cabin*, R. Douglas Sanders, M.D.

Lab Specimen Mailing Containers

Effective October 1, 1971, the Division of Physical Health will distribute Laboratory specimen mailing containers to physicians only at Local Health Units. Such containers will no longer be sent by mail. Physicians should secure the specimen containers they desire by having them picked up at the permanent health units listed below. This change in policy is necessitated by the State's current financial status.

New Castle County Health Unit
3000 Newport Gap Pike
Wilmington, Delaware 19808
Wilmington Health Center
8th and West Streets
Wilmington, Delaware 19801
Middletown Health and Social
Service Center, 214 North Broad
Middletown, Delaware 19709
Kent County Health Unit
Water and Federal Streets
Dover, Delaware 19901

Kent County Health Unit
Water and Federal Streets
Dover, Delaware 19901
Milford Health Center
Old Post Office Bldg.
121 S. Walnut Street
Milford, Delaware 19963
Sussex County Health Unit
S. Bedford St., Ext.
Georgetown, Delaware 19947

CLINICAL NOTICES AND MEETINGS

Exercise and the Heart

The Committee on Exercise and Physical Fitness of the AMA with the Pennsylvania Medical Society, Pennsylvania Heart Association, and the President's Council on Physical Fitness and Sports will jointly sponsor a *Symposium on Exercise and the Heart,* November 8, 1971 at the Host Farm Resort Motel, Lancaster, Pa. For further information write: Fred V. Hein, Ph.D., Secretary, Committee on Exercise and Physical Fitness, AMA, 535 North Dearborn Street, Chicago, Ill., 60610.

Teaching Program

A 5-day meeting for internists and family physicians will be held November 15-19, 1971 in New Orleans. Complete program is available from the Interstate Postgraduate Medical Association of North America, P. O. Box 5445, Madison Wisconsin, 53705.

ACP Courses

The American College of Physicians will present *Clinical Gastroenterology for the Internist,* November 15-17, 1971 at the Lahey Clinic Foundation, Boston, Mass., *Solving Problems in Clinical Hematology,* November 17-19, 1971 at the University of Alabama, Birmingham, Ala., and *Rehabilitation and the Internists,* November 17-19, 1971 at the Mayo Clinic, Rochester, Minn. Write: Registrar, Postgraduate Courses, American College of Physicians, 4200 Pine Street, Philadelphia, Pa., 19104.

Attention! Diabetes Detection Drive

This year, Diabetes Week will be November 14-20. The Delaware Diabetes Association will post its "Detection" Schedules.

Nursing Conference

A one-day conference will be held by the Mid-Atlantic Regional Assembly of Constituent Leagues of the National League for Nursing on November 19, 1971, at the Bellevue Stratford Hotel, Philadelphia.

AMA Clinical Convention

The American Medical Association's 25th Clinical Convention will be held in New Orleans, Nov. 28-Dec. 1, 1971. For physicians, it represents a wonderful opportunity to up-date their education.

Tumor Day Program

The Mercy Catholic Medical Center will sponsor its Tumor Day program for physicians of Philadelphia, Delaware, Montgomery and Camden counties. The afternoon program, *Pre-Malignant Lesions,* will be held on Wednesday, November 10 at the Medical Science Building, Fitzgerald Mercy Division in Darby, Pa., The program is supported in part by a grant from Merck, Sharp & Dohme Postgraduate Program. For registration or additional information contact Dr. C. Jules Rominger, Misericordia Division, 54th Street and Cedar Avenue, Philadelphia, Pa., 19143.

Biomedical Engineering Seminar Series

The Division of Health Science and Department of Mechanical and Aerospace Engineering of the University of Delaware presents its fall program: *Quantitative Analysis of Microcirculatory Behavior,* November 5, 1971, Dr. B. W. Zweifach, speaker; *Artifical Lungs*, December 3, 1971, Dr. Michael H. Weissman, speaker; and *Biomedical Engineering — Interaction of Technology with Medicine,* December 10, 1971, Dr. Lester Goodman, speaker. The series start at 3:45 p.m. in DuPont Hall with coffee at 3:00 p.m., Evans Hall.

Medical Assistants Meet

A forum on the future of medical assisting will highlight the 15th annual convention of the American Asscciation of Medical Assistants. Utilizing the theme, *Age of Achievement*, the meeting will be held Nov. 9-13, 1971 at the Marriott Hotel in Atlanta, Ga. For further information contact: Esther A. Strom, American Association of Medical Assistants, 1 East Wacker Drive, Chicago, Ill., 60605.

AMA Award Rules

Initiated in 1964 to encourage medical reporting contributing to an improved public understanding of health questions, the AMA's Medical Journalism Award has cited more than 150 journalists in all media. Each first place winner received $1000. Write Michael Silva, AMA, 535 North Dearborn Street, Chicago, Ill., 60610 for award rules.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

POSITION WANTED: Doctor's private office, 1½ years college. Experienced in hospital work and typing. References and resume available. Call 658-7596.

PATHOLOGIST: Board-certified. Board eligible in Internal Medicine, Hematology. Doctor of Science. Special interest in Hematology, Immunology, Blood Bank.

ORTHOPEDIC SURGEON: E.C.F.M.G. Board-certified. Also trained in surgery of the hand. Graduate Teheran University Medical School.

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Rx The Physician and The Pharmacist

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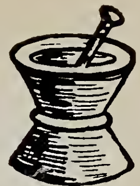

INDOMETHACIN

Interaction with Aspirin

According to the manufacturer, indomethacin (*Indocin*) is a non-steroidal drug which possesses anti-inflammatory properties. Some studies support this claim whereas others indicate that indomethacin is no more effective than aspirin in the treatment of rheumatoid arthritis. In various clinical trials of *Indocin*, the patients were allowed aspirin without restriction. It is possible that the negative results with indomethacin may be due to drug interference. Accordingly, the effect of aspirin upon the serum concentration and on the excretion of labeled indomethacin was studied in eight patients. Significant interference was evident when the drugs were given concurrently, the mechanism possibly being that of decreased gastrointestinal absorption. In rheumatoid arthritis drug trials it is customary for aspirin to be given concurrently and to use the amount of aspirin consumed as a measure of the efficacy of the test drug. Such procedures ignore the possibility of drug interference; hence the validity of the conclusions is open to questions.

Jeremy R and Towson J: Med J Aust 2:127, 1970.

KETAMINE Side Effects

Ketamine hydrochloride (Ketalar), a non-barbiturate general anesthetic, was approved for marketing by the Food and Drug Administration in February 1970. The drug was used in several Belfast hospitals in over 450 anesthetic inductions. Side effects, including elevation in systolic blood pressure, increased pulse rate, and emergence excitement, were a problem. Increases in systolic blood pressure in excess of 20 mmHg occurred in 50% of patients given ketamine in initial doses of up to 2 mg/kg, and in 70% of those given more than 2 mg/kg. A third of all patients receiving ketamine hydrochloride experienced emergence delirium and in half of these the upset was severe. The delirium responded to small intravenous doses of diazepam (2.5 to 5 mg); large doses often reinduced anesthesia and caused respiratory depression. The incidence of undesirable side effects of ketamine hydrochloride may be reduced by certain forms of premedication. Additional investigation is needed to find the most suitable adjuvants and to clarify the specific indications for use of the new drug.

Dundee JW, et al: Lancet, 1:1370, 1970.

OXYTOCIN — Water Intoxication

The sixteenth case of water intoxication due to oxytocin *(Pitocin-Parke, Davis)* is reported (the thirteenth with convulsions). The patient, a 25-year-old primigravida, experienced late postpartum uterine hemorrhage. A total of 4050 ml glucose solution and 200 units oxytocin was administered before the hemorrhage was controlled. The urine output during this period was 3475 ml. Twenty-four hours later the patient had a *grand mal seizure.* Water intoxication due to oxytocin was suspected. The infusion was immediately discontinued, and a slow infusion of hypertonic saline solution commenced. The patient recovered. "Patients receiving high-concentration oxytocin solution, particularly if this is administered for prolonged periods, should have their serum sodium and chloride levels monitored frequently (every six hours) as the only absolute method for detecting water overload."

Bilek W and Door P: Canad MAJ 103:379, 1970.

TOLBUTAMIDE

Teratogenicity

Increasing awareness of the teratogenic effects of tolbutamide (*Orinase*) has led to a restriction of its use in the pregnant diabetic woman. In addition administration of tolbutamide is known to be associated with bone marrow depression and thrombocytopenia in some patients. The present authors observed an infant born to a diabetic mother who was given tolbutamide during pregnancy; the infant had both thrombocytopenia and minor structural abnormalities (large floppy ears and an accesory right thumb.) The serum tolbutamide level in the infant at 27 hours of age was 7.2 mg per cent; the maternal level was 2.7 mg per cent. —

Schiff D, et al: J Pediat 77:457, 1970.

THE FORUM

Environment And Health

Purchased by the Delaware Tuberculosis and Health Society as a question and answer page for physicians or as a page upon which physicians may express their views on environmental issues.

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EIGHTH ANNUAL INFECTIOUS DISEASE SYMPOSIUM

INTRODUCTORY REMARKS

This November issue of the *Delaware Medical Journal* is the second Delaware Infectious Disease Symposium Issue and contains a number of the scientific papers presented at the Eighth Annual Symposium held in Wilmington in May, 1971. A total of 335 scientists registered at this meeting and spent three days in Wilmington participating in discussions relating to the diagnosis and treatment of infections in man.

It was appropriate that Mr. Richard Griffith, President of The Delaware Tuberculosis and Health Society, gave the introductory remarks at this year's symposium. The Delaware Tuberculosis and Health Society has taken a leading role in sponsoring the annual Infectious Disease Symposium in cooperation with the Delaware Academy of Medicine and the Wilmington Medical Center. The original symposium held in Wilmington in 1964 would not have been held without the encouragement and support of Mr. Griffith, who was at that time the director of the Delaware Hospital.

The annual Infectious Disease Symposium has given us the opportunity to bring outstanding scientists to Wilmington to present various aspects of infectious disease. In addition, it has offered the opportunity for investigators working with new antibiotics to review their clinical experience. Wilmington Medical Center house officer participation in the meetings has been an important adjunct to our training program.

The local sponsoring organizations are appreciative of the scientific and financial support given by the pharmaceutical industry.

WILLIAM J. HOLLOWAY, M. D., *Director*
Infectious Disease Research Laboratory
Wilmington Medical Center

PROGRAM

Tuesday — May 4, 1971

Rehoboth Beach Country Club

8:30 *"Changing Patterns in Surgical Infections"*
William A. Altemeier, M.D.

Wednesday — May 5, 1971

Delaware Academy of Medicine

Morning Session

Convener, Richard A. Kahlbaugh, M.D.

9:00 Greetings
Richard R. Griffith, President,
Delaware Tuberculosis and Health Society

9:15 *"Changing Patterns in Surgical Infections"*
William A. Altemeier, M.D.

*10:15 *"Differentiation of Upper from Lower Urinary Tract Infections"*
Marvin Turck, M.D.

*11:15 *"Prevention and Treatment of Respiratory Virus Infections in Children"*
Stanley W. Williams, M.D.

Afternoon Session

Convener, Leo B. Hogan, M.D.

*1:00 *"Antimicrobial Susceptibility Testing — Its Value and Limitations in Medical Practice"*
Allan R. Ronald, M.D.

*1:40 *"Clinical and Microbiological Studies of Cephapirin"*
Simon Jameson, M.D. and
Martin C. McHenry, M.D.

1:52 *"Preliminary Clinical Report on Cephapirin"*
Anita Hodson, M.D.

*2:05 *"Parenteral Clindamycin in the Treatment of Infections"*
Christopher R. Donoho, Jr., M.D.

*2:30 *"Metabolism and Laboratory Studies with Indanyl Carbenicillin (CP 15,464)"*
Kenneth Butler, Ph.D.

2:40 *"Oral Carbenicillin in the Treatment of Urinary Tract Infections"*
Paul O. Madsen, M.D.

*2:50 *"Clinical Experience with Oral Carbenicillin"*
William A. Taylor, M.D.

*3:00 *"Oxolinic Acid in the Treatment of Urinary Tract Infections"*
Paul O. Madsen, M.D.

3:20 *"Intravenous Colistimethate Therapy of Bacteremia"*
Clair E. Cox, M.D.

*3:50 *"Preliminary Report on Intravenous Doxycycline"*
William J. Holloway, M.D.

Thursday — May 6, 1971

Delaware Academy of Medicine

Morning Session

Convener, Martin Randolph, M.D.

*8:50 *"Untoward Reactions to Antimicrobials"*
Marvin Turck, M.D.

*9:40 *"Recovery of Patients from Acute Infection"*
Leighton E. Cluff, M.D.

*10:40 *"Fever of Unknown Origin"*
Donald B. Louria, M.D.

*11:30 *"Antibiotic Combinations"*
Maxwell Finland, M.D.

Afternoon Session

Convener, Robert Bailey, M.D.

*1:15 *"Recent Trends in the Diagnosis and Treatment of Liver Abscess"*
William A. Altemeier, M.D.

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*Included in this issue of the *Journal*.

2:00 *"Opportunistic Infections"*
Donald B. Louria, M.D.

3:00 Round Table Discussion: *"An Exercise in Management of Infection Problems"*
Moderator: Robert I. Wise, M.D.
William A. Altemeier, M.D., Leighton E. Cluff, M.D., Maxwell Finland, M.D., Donald B. Louria, M.D., Marvin Turck, M.D.

Evening Program

Convener, Herman Rosenblum, M.D.

8:30 Armine T. Wilson Memorial Oration
"Cholera 1971"
Colin M. MacLeod, M.D.

Friday — May 7, 1971

Delaware Academy of Medicine

Morning Session

Convener, Lewis Flinn, M.D.

8:50 *"Epidemic Vertigo in Children"*
Stanley W. Williams, M.D.

*9:10 *"The Increasing Incidence of Fungal Infections"*
Eileen L. Randall, Ph.D.

10:00 *"The Management of Pneumonia Before and After Chemotherapy: Its Significance for Medicine and Society"*
Harry F. Dowling, M.D.

*11:00 Gerald Beatty Memorial Lecture
"The Treatment of Tuberculosis and Mycobacterial Pulmonary Disease"
J. Woodrow Savacool, M.D.

Afternoon Session

Convener, John Furlong, M.D.

1:00 *"Urinary Infections in Women: The Perineum as the Portal of Entry"*
Thomas A. Stamey, M.D.

*1:50 *"The Investigation and Management of Recurrent Urinary Infection in Females"*
Allan R. Ronald, M.D.

2:10 *"Urethritis in the Male Associated with 'T' Mycoplasma"*
Maurice C. Shepard, Ph.D.

3:00 *"The Persistence of Pathogenic Bacteria on the Secretory Side of Prostatic Epithelium: Problems in Diagnosis and Therapy"*
Thomas A. Stamey, M.D.

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*Included in this issue of the *Journal.*

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This Symposium was supported in part by contributions from the following:

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ANTIBIOTIC COMBINATIONS

• **Expertise in the use of antimicrobial agents requires familiarity with the advantages and disadvantages of the administration of antibiotics in combination.**

Maxwell Finland, M.D.

There has been a great deal written in recent months about drug combinations, the great bulk of it in the so-called "throwaways" — the "controlled circulation" journals and medical newspapers which are operated for profits they derive largely, or almost exclusively, from pharmaceutical advertising. It is also a lively subject of discussion in trade journals, and, from time to time, even in the general news media — usually on their financial pages. Some of this material has been contributed by respected academic and practicing physicians who have taken issue with certain of the recent evaluations made by the panels of experts who re-evaluated the efficacy of drugs approved by the US Food and Drug Administration (FDA) between 1938 and 1962. These evaluations were conducted under the aegis of the National Academy of Sciences-National Research Council (NAS-NRC) and with guidelines which the FDA has now proposed to adopt for the approval of all new drugs in fixed combinations.

I shall not dwell on the history of the drug laws, beginning with the Pure Food and Drug Act of 1906, which was designed primarily to prevent adulteration of foods and drugs, and later the Food, Drug and Cosmetics Act of 1938, which required proof of safety of all new drugs, and culminating in the Drug Amendments of 1962 (also referred to as the Kefauver-Harris Amendments), which require proof of efficacy as well as safety of all new drugs before they can be approved for prescription by physicians. The background of these laws and the various amendments and regulations are well summarized and ably presented in Dr. Harry F. Dowling's carefully prepared, scholarly, well balanced and very readable book, recently published under the title *Medicines for Man.*[1]

The various panels of experts, using guidelines prepared after consultation and with the general approval of representatives of industry, the FDA, the Policy Advisory Committee of the Drug Research Board (DRB) of the NRC and all the panel chairmen, considered the many claims of the manufacturers for the efficacy of each of the drug combinations they were marketing. They concluded, from all the data and literature available to them, and based on their own expert opinions, that there was insufficient evidence to warrant these claims for the great majority of drug combinations available in fixed dose ratios, which they were asked to review. This was particularly true of the five panels of 30 experts who dealt with anti-infective drugs; these particular panels were further guided by a special policy statement on fixed combinations of antimicrobial agents which was prepared by two of the panels and adopted by the members of the other three panels.[2] Some of the conclusions and recommendations of the Panels on Anti-Infective Drugs dealing with fixed combinations have already been implemented without objections by the manufacturers; others were put into effect after "hearings" or after litigation in the courts; and the others, for a variety of reasons, are still under review by the FDA.

During the heated discussions that have been going on in the press, in the medical literature and at various meetings, there have been many confusing and contradictory statements about drug combinations. In particular, the subject of fixed combinations has been confused with that of multiple drug therapy; and the combinations of pharmacologic agents

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Dr. Finland is Epidemiologist, Boston City Hospital; George Richards Minot Professor of Medicine, *Emeritus*, Harvard University, Boston, Mass.

have been equated with those of antimicrobial agents in fixed-dose ratios. Examples have often been cited of multiple drug therapy, or even some drugs available in fixed ratios, which are accepted as well proved but which are not necessarily among those rated by the panels as ineffective.

When Dr. Holloway invited me to participate in this Symposium, I thought this might offer an opportunity to review the subject as related to my own area of competence, namely, antibacterial drugs. For this purpose, I propose to present, in a more or less didactic fashion, without detailed documentation, but with some brief comments, the facts I have been able to gather from the literature, relating to the general subject of multiple drug therapy and particularly to fixed combinations of antibacterial agents.

Major Reasons for Prescribing Combinations of Antibacterial Agents

The following are some of the justifications for prescribing more than one antibacterial agent and the problems they raise, or factors which must be considered when they are used:

1. *To broaden the therapeutic range so as to include organisms not adequately affected by one of the agents when used alone*

When used for this purpose the choice of drugs should be based on a definite or highly probable bacteriological diagnosis and the known effectiveness of the drugs selected against the probable causative organisms.

2. *For life-threatening infections until a definite bacteriological diagnosis is established*

Under such circumstances one may select either a) the most suitable single agent that is most effective against the most likely causative organism, or b) multiple specific agents, each against a different, but likely, causative bacterial agent. A single, broad-spectrum drug is often, but not always, preferable to multiple agents. In any event, it is essential to obtain materials from all sources — blood, urine, sputum and exudate — for culture *before* starting treatment, so that the appropriate therapy, generally with the single most effective agent, may be used and others discontinued as soon as the correct etiologic diagnosis is established.

3. *To prevent, delay or reduce the degree of resistance that may emerge before bacteriological cure is effected*

This indication arises particularly in the treatment of tuberculosis, chronic pyelonephritis, endocarditis or other deep-seated or inaccessible infections in which a) the causative organism is known to acquire resistance rapidly (resistant mutants emerge), or b) the antibiotic is known to induce resistance rapidly. Examples of such organisms are: *Staphylococcus aureus, Mycobacterium tuberculosis,* and some strains of *Proteus* and of *Escherichia coli.* Examples of such drugs are streptomycin, erythromycin, novobiocin, rifampin and nalidixic acid. If used for these indications, each agent must be active against the causative organism by a different mechanism or at a different site; it should have similar pharmacokinetics, but there should be no cross-resistance between or among the agents used.

4. *To suppress or prevent overgrowth of other bacteria that are already present, or which might be acquired*

This may be justified if directed against a single, highly susceptible organism, eg, penicillin and group A hemolytic streptococcus, sulfadiazine and a susceptible meningococcus, or an active antistaphylococcal agent against a known susceptible strain during an influenza epidemic associated with a high prevalence of severe staphylococcal pneumonias. It has been invoked by using a penicillinase-inhibiting penicillin as a means of suppressing penicillinase production by staphylococci to permit the action of penicillin G. These uses are of limited values because a) the anti-penicillinase activity has not been regularly achieved *in vivo,* b) it is not possible to suppress all pathogens, and c) resistant ones tend to emerge to colonize or to cause superinfections.

5. *To suppress fungi and yeasts during therapy with large doses of broad-spectrum or multiple antibacterial agents*

Such use does not prevent overgrowth or superinfection by other organisms, such as *Proteus* or *Staphylococcus.*

6. *To reduce the dose-related toxicity by using smaller amounts of each agent*

Such a mechanism can be invoked for closely related drugs. However, each agent may contribute its own peculiar type of toxic effect.

7. *To utilize different pharmacokinetics*

Agents with different properties of diffusion into cells, cerebrospinal fluid, bile, or serous cavities are used for this purpose. Examples are given in subsequent sections.

Some Useful Combinations of Similar Antimicrobials

There are a number of examples of such combinations which have been used to a varying extent.

1. *Two or three sulfonamides*

The combination of sulfapyrimidines (sulfadiazine and its methylated derivatives—sulfamerazine and sulfamethazine) has been recommended and used effectively in equal amounts of each. When so used, they have an additive effect, with reduction in the occurrence of crystalluria because each has its individual solubility which is unaffected by the presence of the other, thus reducing the crystalluria, hematuria, and renal tubular obstruction resulting from the full dose of the single component. The indications are the same as for the individual components or other sulfonamides, primarily for urinary tract infections.

2. *Streptomycin and dihydrostreptomycin*

The eighth nerve toxicity of the former is primarily vestibular, and that of the latter is primarily cochlear, but each may produce both effects, and the use of equal parts of each was considered as possibly reducing both types of toxicity. This combination was exploited for a while in the treatment of tuberculosis but has generally been abandoned because the cochlear effect was not really prevented. Moreover, dihydrostreptomycin is no longer recommended for systemic use in this country.

3. *Procaine penicillin with aqueous penicillin G and benzathine penicillin*

Combination of two or all three of these three forms of penicillin has been recommended as initial therapy or for use as a single dose to take advantage of the different rates of absorption of each of these forms. The indications are the same for penicillin G, mainly for the treatment of gonorrhoea or for the treatment or prevention of group A hemolytic streptococcal infections.

4. *An isoxazolyl penicillin plus penicillin G*

This combination has been recommended and used to secure the action of penicillin G and to broaden its spectrum so as to include some resistant staphylococci and gram-negative bacilli, but its clinical effectiveness is not established.

Combinations of Dissimilar Antimicrobials Reported as Being Useful

1. *Penicillin plus streptomycin*

For several years this combination was the one most frequently employed, particularly by surgeons, for its supposed broad spectrum, or to initiate therapy, or for prophylaxis in mixed infections. In the fixed combination it was used extensively where penicillin alone was indicated. In appropriate dosage of each it has been shown to be synergistic *in vitro* and *in vivo* against many strains of *Streptococcus faecalis* and has been used successfully in the treatment of endocarditis due to this organism. Much ototoxicity, including deafness, has resulted from the prolonged, unnecessary, and irrational use of this fixed combination.

2. *Various combinations of dissimilar agents active against the same causative organisms*

The best example is the use of two or three dissimilar antimycobacterial agents for tuberculosis (isoniazid, with paraminosalicylic acid and streptomycin or with ethionamide or ethambutol). The multiple therapy, each in full doses, is given to prevent or delay the emergence of resistant tubercle bacilli. Combinations of active antistaphylococcal agents are also used in the treatment of endocarditis or osteomyelitis, when one of the agents has a high mutation rate, such as erythromycin or streptomycin. These are rarely called for now that effective cephalosporins and penicillinase-resistant penicillins are available.

3. *Penicillin plus sulfonamides*

This combination is offered for its broad spectrum and for the different pharmacokinetics and modes of action of the components. It has been used in the treatment of meningitis, actinomycosis and other susceptible infections.

4. *Chloramphenicol plus streptomycin or a sulfonamide*

These drugs given together presumably offer favorable pharmacokinetics in the management of meningitis due to gram-negative bacilli.

5. *Tetracycline plus amphotericin B or nystatin*

The antifungal agent is given when oral tetracycline is indicated in young children and in women with the purpose of suppressing yeasts and fungi and preventing thrush and vaginitis due to *Candida.* Although this seems quite rational, it has been difficult to find adequate, consistently significant clinical confirmation.

Antibiotic Combinations Shown to Be Synergistic in Vitro

Synergy has been variously defined, but it generally refers to an action or rate of antibacterial action of two agents together which cannot be achieved by either one separately, or which requires significantly smaller amounts of each to achieve the same or greater biological effect. Such action has been demonstrated by many workers with various combinations against selected species and strains of pathogens. Some of the most prominent and some recent examples may be cited.

1. *Penicillin plus either streptomycin, kanamycin or gentamicin or with vancomycin*

Such combinations, as already noted, have been used with success in the treatment of enterococcal endocarditis. Synergy has been demonstrated against selected strains of *Proteus mirabilis* and *P. vulgaris.*

2. *Ampicillin or cephalothin plus streptomycin or kanamycin*

These combinations have exhibited synergy against some strains of *Klebsiella, Enterobacter, E. coli* and *Proteus.*

3. *Carbenicillin plus gentamicin or polymyxin*

Evidence for synergy of these combinations against some strains of *Pseudomonas aeruginosa* has been shown to be strain specific. More recently carbenicillin plus gentamicin have been shown to exhibit antagonism *in vivo* with apparent reduction in the activity of the gentamicin during concomitant administration of carbenicillin in some cases, although clinical evidence of a favorable synergistic effect has been reported by several workers in a number of cases of pseudomonas infections.

4. *Ampicillin or penicillin G plus either cloxacillin or nafcillin or cephalothin*

These combinations of a penicillinase-sensitive penicillin with a penicillinase inhibitor have been shown to act synergistically against selected strains of *Pseudomonas, Enterobacter* and *Proteus morganii* (but not against strains of other species of *Proteus*). Some cases of urinary tract infections due to strains of *Pseudomonas* which have exhibited such synergy *in vitro* have apparently responded to treatment with the same combination.

5. *Tetracycline plus oleandomycin*

The synergy against resistant *S. aureus* on which the introduction of this combination was based and justified has not been confirmed.

6. *Penicillin G plus erythromycin*

Some evidence for synergy of this combination against strains of *S. aureus* that were resistant to each agent separately has been presented, but to my knowledge this has not been confirmed by others, and antagonism of this combination against some susceptible strains has also been encountered.

7. *Penicillin plus either tetracycline or chloramphenicol*

Various species of enterobacteria, including some of *Salmonella,* have shown synergy to these combinations.

8. *Polymyxin B plus sulfadiazine (1:20)*

Only strains of *Serratia marcescens* are affected synergistically by this combination in this ratio.

9. *Polymyxin plus chloramphenicol*

Some strains of *Pseudomonas* are acted on by this pair of antibiotics synergistically.

10. *Tetracyclines plus either streptomycin or penicillin*

Synergy with the streptomycin combination against *Brucella* has been demonstrated *in vitro* and in clinical studies, but clinical reports confirming the *in vitro* synergy of tetracycline with penicillin in the treatment of brucellosis are not available to confirm this action.

11. *Ampicillin plus chloramphenicol*

Synergy of this combination has been reported against strains of *Salmonella*, but adequate proof of such an action in patients with salmonellosis is not available.

12. *Trimethoprim plus sulfamethoxazole (1:5)*

This combination is clearly synergistic in this ratio against many bacterial strains and species. Both components act by a similar mechanism at different stages of the synthesis of folate. Although the optimal ratio for synergy may vary for different species or strains *in vitro*, the 1:5 ratio is the one that has been reported as being effective in a number of clinical trials in Great Britain and in other countries. It is now under clinical trial but not yet available in this country.

Antibiotic Combinations Reported as Showing Antagonism

The antithesis of synergy, ie, reduction in the antibacterial effect or rate of killing by one agent when used in combination with another, is called antagonism. Such an effect is less common than synergy but has been clearly demonstrated with some combinations of antimicrobials against some species, or individual strains. The following are among those that have been reported *in vitro*.

1. *Penicillin plus a tetracycline or chloramphenicol*

Both of these combinations have been found to exhibit antagonism *in vitro* against *Streptococcus*, *Pneumococcus* and *Klebsiella pneumoniae*, and in infection of mice with some strains of these organisms. Antagonism of penicillin and chlortetracycline has been demonstrated in experimental pneumococcal infections in mice, and also clinically in the treatment of pneumococcal meningitis and in scarlet fever.

2. *Penicillin G plus erythromycin*

As already noted, this combination, which may show synergy against *S. aureus*, has exhibited an antagonistic effect against some strains of group A hemolytic streptococcus and also in the treatment of cases of scarlet fever due to this organism.

3. *Penicillin G or kanamycin plus chloramphenicol*

These combinations have been found to be much less active than either agent alone against a number of strains of *Proteus mirabilis*.

4. *Ampicillin plus polymyxin B or colistin*

Antagonistic effects of these combinations have been reported against some strains of *Salmonella*.

5. *Streptomycin or kanamycin or nalidixic acid plus either chloramphenicol or tetracycline*

Each of these combinations has shown antagonism against strains of *Proteus*.

6. *Erythromycin or other macrolides plus lincomycin or clindamycin*

These combinations of agents, which act at the same cytoplasmic site on the same ribosomes, are completely antagonistic *in vitro* against strains of *S. aureus* and other susceptible species. There is no evidence of such antagonism *in vivo*.

7. *Penicillin G plus streptomycin*

Antagonistic action of this combination against some strains of *Pseudomonas* has been reported.

8. *Ampicillin plus chloramphenicol*

This combination, which may act synergistically against some strains of *Salmonella*, has been reported as showing definite antagonism against *Hemophilus influenzae in vitro*. This is an important observation, which has not been recognized in the treatment of meningitis due to this organism, but should be kept in mind as a possible explanation for relapses in patients treated with these agents, which are commonly employed for that purpose in young children.

Some Incompatibilities of Antibiotics

Many failures of antibiotic therapy are associated with improper use of the antibiotics. A number of such failures have been traced to incompatibilities of these agents when mixed together or when administered in certain menstrua.

1. *The following antibiotics have been found incompatible when mixed with others for intravenous injection:*

Amphotericin B
Cephalosporins (cephalothin, cephaloridine)
Chloramphenicol
Colistimethate
Erythromycin (or other macrolides such as oleandomycin)
Lincomycin or clindamycin
Novobiocin
Polymyxin B
Rifampin
Tetracyclines (all analogues)

2. *The following have been found to be incompatible with antibiotics for parenteral therapy and should not be mixed with them:*

Calcium gluconate or chloride
Corticosteroids
Heparin (this may be used before and after the antibiotic is injected but not together)
Pressor amines (with potassium salts)
Vitamins, single or multiple

3. *Oral neomycin plus penicillin G or V or phenethicillin*

The absorption of each of these oral penicillins is reduced when given with oral neomycin.

Undesirable Aspects of Uncritical Use of Antimicrobial Combinations Particularly Those Available in Fixed Ration

1. It is not possible to make any absolute generalization concerning the usefulness or undesirability of any combination against any microbial species or strains; successful results have been rare, whereas false expectations are frequent and disappointing.

2. Multiple antimicrobials may produce hypersensitivity and other untoward reactions to more than one of the drugs, including those that are not contributing any useful antibacterial activity (eg, to novobiocin or triacetyloleandomycin when given together with tetracycline; ototoxicity from streptomycin when combined with penicillin).

3. Resistance to one or both components of the combination may be present or develop and render the combination ineffective, as when streptomycin is given with penicillin, or when novobiocin or oleandomycin is given with tetracycline.

4. The drugs may suppress but not eradicate the causative organism and delay or make it difficult or impossible to establish a bacteriological diagnosis.

5. The possibility of colonization and superinfection is increased when multiple antibiotics are used, and the new organisms or infections are then resistant to all of the antibiotics that were used.

6. The fixed combinations generally provide inadequate dosage for serious infections that respond to only one of the agents if given in full doses.

7. It is rarely possible to include a proper fixed dose ratio of any two or more antimicrobials that will provide adequate treatment for infections for which they are intended. One possible exception: trimethoprim and sulfamethoxazole, a combination currently under investigation.

8. The physician is confused by poorly documented, testimonial types of endorsements and by deceptive or misleading advertisements of combinations as though they are new and more active drugs when more often they contain agents which the physicians have already used without success.

9. There is an unnecessary increase in cost when the combinations are used, particularly when single ones are adequate.

REFERENCES

1. Dowling HF: Medicines for Man: The Development, Regulation and Use of Prescription Drugs. New York, A A Knopf, 1971.
2. Drug Efficacy Study. Final Report to the Commissioner of Food and Drugs, Food and Drug Administration, from the Division of Medical Sciences, National Research Council — National Academy of Sciences, Washington, DC, US Gov Printing Office, 1969.

COMPLICATIONS OF ANTIMICROBIAL THERAPY

• All of the antimicrobial agents available for use in man are capable of producing significant side effects. The practicing physician must select the proper antibiotic in the treatment of an infectious disease, and he must also be aware of the possible side effects of the agent that he selects.

Marvin Turck, M.D.

Although antimicrobial agents have had a generally favorable impact on many human infections, they have often been a double-edged sword by exerting their toxic effects on both the microbe and the host. At times the complications of treatment are inevitable and predictable and clearly are related to interference with essential metabolic function of normal cells. At other times undesirable effects seem to be specific for a given host, are idiosyncratic and largely unpredictable. Finally, in some instances the side effects of these drugs are due to their ability to upset the delicate biologic balance between microorganism and host, resulting in bacterial resistance and superinfection.

There have been numerous excellent reviews[1-5] of the dangers inherent in antimicrobial therapy, and only the more important developments will be summarized. The discussion will deal with six different categories of drugs:

1. The penicillins and cephalosporins
2. The broad-spectrum agents
3. Agents effective primarily against gram-positive bacteria
4. Agents effective primarily against gram-negative bacteria
5. Antifungal antibiotics
6. Sulfonamides and other agents useful in infections of the urinary tract

Penicillins and Cephalosporins

The penicillins and cephalosporins presently in clinical use are relatively nontoxic for mammalian tissue. However, there is some evidence that the semisynthetic penicillins may have inherent toxicity not found in the parent compound, benzylpenicillin. For example, a few cases of neutropenia, renal functional impairment, and elevations of serum glutamic oxaloacetic transaminase have been reported following administration of methicillin, oxacillin or carbenicillin. It should be remembered also that all of the penicillins are capable of causing central nervous system excitation and convulsions when administered in very high doses, especially to patients with pre-existing renal disease. In addition, experience with the antimicrobial cephaloridine has suggested that this agent may be potentially nephrotoxic and should be avoided in patients with underlying renal disease. The main advantage of cephaloridine over cephalothin is that parenteral injection is better tolerated. Occasionally treatment with cephalothin and other cephalosporin antibiotics has resulted in the appearance during therapy of a positive Coombs test. This has not been associated, however, with a hemolytic anemia as, for example, is the case with alphamethyldopa.

Most of the untoward reactions to this group of antibiotics are not toxic but are related to hypersensitivity, and are usually characterized by urticaria or other erythematous skin eruptions. Less frequently the penicillins and the cephalosporins cause fever and arthralgias resembling serum sickness. There is probably complete cross-allergenicity among the true penicillins, and it seems pru-

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dent to avoid, in patients with a history of a penicillin reaction, rechallenge with any of this group of drugs including the semisynthetic congeners. Ampicillin appears to have a lower incidence of immediate anaphylactoid reactions than does penicillin G. This difference may be due to traces of a proteinaceous constituent of the fermentation brew detectable in penicillin G, and even in 6-aminopenicillanic acid, but not in the semisynthetic penicillin derivatives. Delayed reactions, on the other hand, occur more frequently with ampicillin. In a recent report of drug surveillance among almost 4000 patients, rashes occurred in 9.5% of patients treated with ampicillin, 4.5% of those treated with other penicillins, and 1.8% of individuals not given these drugs. Furthermore, eruptions beginning after the first week of treatment were much more common with ampicillin. Another peculiarity of ampicillin is its tendency to cause a morbilliform, macular-papular eruption rather than urticaria. In addition, there is a propensity for patients with infectious mononucleosis to develop rash following treatment with ampicillin. Whether or not these are "true" penicillin reactions is not presently known.

Although the similarity between the cephalosporin nucleus (7-amino-cephalosporanic acid) and penicillin nucleus (6-amino-penicillanic acid) suggests that cross allergenicity may be a problem, degradation of cephalothin, cephaloridine, cephaloglycin and cephalexin proceeds along different pathways from those followed by penicillin. Nevertheless, extreme caution in administering a cephalosporin to a patient with known previous penicillin hypersensitivity reaction is indicated since there have been patients in whom an identical reaction has followed administration of both penicillins and cephalosporins.

There is some evidence that superinfections may be more frequent among patients treated with the newer penicillins or cephalosporins than in those given penicillin G. This may be related to the higher dosage of the new agents and also to the use of these drugs in more severely ill and debilitated patients whose skin and mucous membranes may already be colonized with gram-negative organisms prior to treatment with antimicrobials.

Broad-Spectrum Agents

Although several antibiotics may be effective against common gram-positive and gram-negative pathogens, mycoplasma, and rickettsia, the term broad spectrum generally has been associated with the tetracycline group of antibiotics and with chloramphenicol. The term will be used in this context.

Both toxic and hypersensitivity reactions are uncommon when tetracyclines (tetracycline hydrochloride, oxytetracycline, chlortetracycline, demethylchlortetracycline, methacycline and doxycycline) are used in recommended dosage, and most undesirable effects consist of gastrointestinal disturbances. Fungal (*Candida*) overgrowth leading to glossitis, stomatitis, pruritus ani and vulvae is more common with the tetracycline group of antibiotics but is more bothersome than hazardous. Most of the serious side effects are related to suppression of the normal bacterial flora, resulting in superinfection, particularly with resistant *Staphylococcus aureus*. Staphylococcal enterocolitis and pneumonia may be insidious in onset and may be fatal.

More recently there has been noted a group of heretofore less recognized complications. One of these, photosensitivity, is more frequent with demethylchlortetracycline, and patients receiving this drug should avoid sunlight. The tetracyclines have also been shown to have antianabolic activity resulting in nitrogen retention in certain susceptible patients, particularly those with pre-existing azotemia and renal failure. These drugs have also been incriminated in causing acute hepatic necrosis, followed by renal failure, especially in pregnant or post partum women to whom tetracyclines were administered in relatively large doses by parenteral route. An unusual complication has been the occurrence of a Fanconi-like syndrome related to the use of outdated oral tetracyclines. This has been attributed to degradation products of the drugs and, fortunately, has been reversible. Finally, when infants and children were exposed to these drugs early in life or *in utero*, mottling and discoloration of the teeth and abnormal deposition of the drug in bones have been reported.

Chloramphenicol continues to be a well-tolerated antibiotic and causes few hypersensitivity type reactions. In newborns, especially prematures, treated with more than 50 mg/kg/day it may cause the gray syndrome, which is characterized by lethargy, cyanosis, and a peculiar pallor. The syndrome, which has been attributed to an accumulation of chloramphenicol in the blood stream related to immaturity of the glucuronyl-transferase system in the newborn, may culminate in circulatory collapse and death.

More pertinent to the problem, is the relatively rare but extremely important hematotoxic potential of chloramphenicol. There are at least four things which may happen to the blood-forming apparatus of patients given chloramphenicol: 1. Slight transient leukopenia may occur; this is usually of little consequence. 2. One may see large, vacuolated, normoblastic cells in the bone marrow. Whether this stage of chloramphenicol toxicity is a fore-runner of aplastic anemia is not clear. These cells are also seen in other disturbances of erythropoiesis and may not be specific for chloramphenicol toxicity. 3. An interesting observation has been the deleterious effect of chloramphenicol in anemic patients. For example, it has been shown that patients with iron deficiency anemia fail to respond to iron with reticulocytosis as long as they are receiving chloramphenicol, and it is not until the drug is withdrawn that blood values return to normal. Similar observations have been made with vitamin B_{12} in pernicious anemia. 4. Complete necrosis of the bone marrow with consequent aplastic anemia, agranulocytosis and, more rarely, thrombocytopenia may occur.

There are a number of clues which should lead the clinician to suspect that chloramphenicol is interfering with erythropoiesis. A high serum iron, high saturation of iron-binding protein, and absence of reticulocytosis have all been helpful in detecting chloramphenicol toxicity. Unfortunately, however, there is no iron-clad guarantee that these abnormalities herald the early onset of marrow aplasia. In fact, many workers feel that there is little relation between these abnormalities and the subsequent development of bone marrow failure. Although the mechanism for the marrow aplasia is unknown, it is felt by some that the interaction of chloramphenicol with certain gut bacteria may lead to a toxic degradation product. Pertinent to this point, there seems to be no recorded case in which marrow aplasia has followed administration of chloramphenicol by parenteral routes alone. This, however, may merely be a chance observation related to the inordinately greater number of patients given chloramphenicol by mouth. In either case, the best rule of thumb in employment of chloramphenicol is to use this drug only in severe infections in hospitalized patients in whom sensitivity tests or the clinical picture dictates that chloramphenicol is superior to other available drugs. Never should this drug be administered prophylactically and rarely for prolonged periods.

Agents Active against Gram-Positive Bacteria

This is a group of antibiotics whose primary usefulness lies in the realm of gram-positive infections in patients with penicillin allergy.

Erythromycin and oleandomycin are macrolide antibiotics similar in antibacterial activity. Toxic and hypersensitivity reactions are uncommon; superinfections are also rare. Gastrointestinal discomfort is the main untoward effect and is more common with high dosages. Loose stool and diarrhea with these drugs probably are associated with an increase in gastrointestinal motility rather than to a change in bowel flora. Hepatotoxicity, manifested primarily by an elevation in bilirubin and alkaline phosphatase, has been associated with a modified preparation of erythromycin (the lauryl ester of erythromycin propionyl sulfate) and of oleandomycin (triacetyloleandomycin). Although these dosage forms are associated with increased antibacterial activity, perhaps related to better absorption, jaundice will develop in some patients. Presumably, this toxic effect is a consequence of competition for conjugating enzymes. The icterus disappears promptly upon discontinuing the drugs, and permanent hepatotoxicity probably does not occur.

Lincomycin and 7-chloro-lincomycin (clindamycin) are closely related antibiotics effective against many common gram-positive pathogens, including most staphylococci. These drugs are nontoxic and relatively nonallergenic, and lincomycin, at least, is well tolerated by both oral and parenteral routes. Gastrointestinal discomfort is the main drawback. Clindamycin is associated with increased antibacterial activity in serum, perhaps related to better absorption.

Vancomycin is a potent antistaphylococcal and antienterococcal antibiotic and is most useful in seriously ill patients who are allergic to penicillin. Its main drawback is that it must be administered intravenously and is frequently associated with thrombophlebitis and pain. Nephrotoxicity has been reported in a very small percentage of patients; some investigators attribute this to impurities in some of the original preparations of vancomycin. The major untoward effect of vancomycin is ototoxicity resulting in permanent deafness. This complication has been observed primarily in azotemic individuals with impaired renal function. A small number of patients have also developed a hypersensitivity type reaction to vancomycin manifested by chills, fever, rash and vascular collapse. Pretreatment with antihistamines may prevent this side effect.

Novobiocin enjoyed temporary vogue in the treatment of staphylococcal infections before the availability of the semisynthetic penicillins and was marketed primarily in the form of a novobiocin-tetracycline combination. Several untoward reactions ranging from mild gastrointestinal disorders and skin eruptions to fever and severe jaundice have been reported with this drug. A metabolic breakdown product of this glycoside antibiotic causes yellow discoloration of the skin and mucous membranes independent of its effect on the liver.

Bacitracin should be administered only by the topical route. It is bactericidal against the common gram-positive organisms and is virtually without side effects when used topically. Although the drug is nonallergenic and resistance to it is seldom found, parenteral administration is painful and is associated regularly with impaired renal function culminating in both glomerular and tubular damage. Since the advent of safer antistaphylococcal antibiotics, parenteral administration of bacitracin is rarely, if ever, justified.

Agents Active against Gram-Negative Bacteria

There are a number of antibiotics including streptomycin, kanamycin, gentamicin, neomycin, colistin (polymyxin E) and polymyxin B, with an antibacterial spectrum directed primarily against gram-negative pathogens.

Streptomycin, kanamycin, gentamicin and neomycin have similar chemical, pharmacologic and toxic properties. Neomycin is probably the most toxic of the group, but the others are also associated with significant toxicity primarily to the auditory nerve and the kidney. The ototoxic effects of streptomycin and probably of gentamicin are associated with destruction of the vestibular nuclei and with lesions of the terminal fibers of the eighth cranial nerve. Kanamycin and neomycin affect the auditory portion of the nerve. Although deafness and vestibular malfunction have usually followed excessive, repeated or prolonged administration of one of these drugs, permanent damage has also occurred with ordinary doses administered for as short a period as seven days. These complications have been more frequent in elderly patients, especially those with pre-existing renal disease.

Nephrotoxicity with streptomycin, characterized by casts, red cells and proteinuria in the absence of previous renal disease, is seldom observed nowadays because highly purified preparations of streptomycin are the only ones used. Nephrotoxicity associated with neomycin and kanamycin is related both to dose and total duration of treatment. With neomycin nephrotoxic effects are uncommon if therapy does not exceed 1.0 gm/day for seven days. In patients with pre-existing renal disease this dosage must be decreased, and blood levels should be monitored. These same principles apply to kanamycin, and a total course of therapy should not exceed 20 gm in adult patients with normal renal function. Although less is known about the nephrotoxic potential of gentamicin, there is every reason to suspect that it has a similar propensity to cause nephrotoxicity. Interestingly enough, these drugs appear relatively less toxic in infants than in adults.

Ordinarily, absorption from the gastrointestinal tract is negligible with streptomycin, kanamycin, neomycin and gentamicin; however, when these drugs are administered orally to patients with ulcerative disease of the bowel or decompensating liver disease, absorption may increase and toxic levels can be reached, particularly if there is concomitant renal failure.

An unusual untoward effect of these agents has been the production of respiratory arrest following their intraperitoneal or systemic administration at the time of surgery; this is especially prone to occur in patients concomitantly receiving curare-like neuromuscular inhibitory drugs. There have been also instances of a myasthenia gravis-like syndrome reported with these drugs.

Although not common, these agents are capable of evoking hypersensitivity type reactions with fever and eosinophilia. Contact dermatitis has occasionally followed prolonged exposure to neomycin and streptomycin. Finally, when these drugs are given orally some patients develop a severe watery diarrhea, which may progress to a sprue-like illness even after diarrhea has subsided. In other instances, fulminant staphylococcal enterocolitis has developed during oral treatment with neomycin. Patients with decompensating hepatic disease who are receiving this drug to abort or reverse hepatic coma are particularly susceptible to this complication.

Colistin and polymyxin B have similar antibacterial activity and toxicity when expressed in therapeutically equivalent doses. Their toxicity, which is dosage dependent, is exerted mainly on the nervous system and kidney. Renal disturbances are usually completely reversible and consist of transient azotemia and changes in the urinary sediment. Neurologic symptoms are related to the ability of the polymyxins to inhibit neuromuscular transmission and vary from mild paresthesia, especially around the mouth, to severe vertigo, ataxia and, at times, complete paralysis. These symptoms usually subside within seventy-two hours of discontinuing treatment and do not leave lasting residua. The polymyxins are decidedly more toxic in patients with pre-existing renal disease, in whom blood levels and kidney function should be carefully monitored. True allergic reactions are uncommon. One apparent advantage of colistin over polymyxin B is less pain at the site of intramuscular injection, which may be related solely to the addition of the local anesthetic, dibucaine, to colistin.

Antifungal Antibiotics

Currently there are three effective antifungal antibiotics in general clinical use. Nystatin and griseofulvin are useful for surface infections, and amphotericin B for systemic infections.

Nystatin and griseofulvin are largely nontoxic when administered by mouth. Nystatin is poorly absorbed, and its main usefulness is for the topical treatment of muco-cutaneous monilia infections. It has also been used prophylactically along with broad-spectrum antibiotics in an attempt to suppress fungal superinfection. Griseofulvin is absorbed from the gastrointestinal tract and is effective in controlling many superficial fungal infections of the skin, hair and nails. Amphotericin B is the primary drug available for treatment of systemic mycotic infections. It must be administered by intravenous route (or intrathecally in some cases of meningitis) and causes a variety of side effects. The most frequent side reactions consisting of chills, fever, nausea, vomiting and headache, are marked during the first treatment periods and diminish in intensity as treatment progresses. Phlebitis is also common following intravenous administration. These undesired effects may be minimized by premedication with aspirin or an antihistamine and addition of a small amount of hydrocortisone to the infusate.

The three major toxic effects associated with amphotericin B are anemia, which occasionally is severe enough to require transfusions, hypokalemia, which may necessitate potassium supplementation, and nephrotoxicity. Continued use of the drug has been associated with irreversible kidney damage and a peculiar, intrarenal calcification. Usually, however, azotemia and functional impairment are reversible, although recovery after amphotericin B is discontinued may be protracted, and in some instances the renal lesions never heal completely.

Sulfonamides and Other Urinary Tract Antimicrobials

The sulfonamides remain the drugs of choice in the initial treatment of urinary tract infections in patients with no history of recurrent urinary infections or of urinary tract obstruction. Although they have been used for a number of years and are relatively safe, they have the potential for causing untoward reactions. There is some evidence that the long-acting preparations may carry a greater risk of reactions than the other sulfonamides. In concentrated urine, sulfonamides can crystallize in the tubules; fortunately this occurs infrequently with the newer, acetylated compounds. The sulfonamides can also lead to hemolytic anemia in patients with a deficiency of glucose-6-phosphatase in red blood cells. Other unusual reactions include skin rashes, hemolytic and aplastic anemia and other bone marrow disturbances, renal and hepatic toxicity, myocarditis, drug fever, and arthritis. Sulfonamides also have been associated with defects in bilirubin metabolism, especially in premature infants, and have been implicated in kernicterus. Fortunately, most of these toxic, allergic and idiosyncratic reactions are mild or uncommon.

Nitrofurantoin is another antibacterial agent used primarily in the treatment of patients with infection of the urinary tract. The main untoward reactions are epigastric distress, nausea, and vomiting which can be minimized by taking the drug with meals. There is some evidence that a new macromolecule of nitrofurantoin, Macrodantin, is better tolerated. Similarly to the sulfonamides, nitrofurantoin may cause hemolysis in patients with glucose-6-phosphatase deficiency. It has also been associated with a pleural-pneumonia syndrome, eosinophilia, and rash and has been found to cause peripheral polyneuritis, especially in elderly patients with renal impairment, a few of whom have died or have been left with permanent neurologic deficits.

Nalidixic acid also has various reactions, which, in general, have been reversible. These have included gastrointestinal upset, urticaria, pruritus, rash, convulsions, transient visual disturbances, and photosensitivity. The excretion products may give a false positive test for glucose in the urine when tested with reagents such as Benedict's solution, a consequence of the liberation of glucuronic acid from nalidixic glucuronide.

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During the first great epidemic of influenza towards the end of the nineteenth century a London evening paper sent round a journalist-patient to all the great consultants of that day, and published their advice and prescriptions: a proceeding passionately denounced by the medical papers as a breach of confidence of these eminent physicians. The case was the same; but the prescriptions were different, and so was the advice.

George Bernard Shaw (1856-1950) *The Doctor's Dilemma,* "Preface on Doctors"

ANTIMICROBIAL SUSCEPTIBILITY TESTING —

Its Value and Limitations in Medical Practice

• Carefully performed laboratory susceptibility tests can provide assistance to the physician in his selection of antimicrobial agents. However, the clinician and the laboratory technician must be aware of the limitations of these laboratory procedures.

Allan R. Ronald, M.D.

During the past decade, the proliferation of antimicrobics has made the problem of selecting the best therapy for the individual infected patient inordinately complex. In order to make this decision correctly the physician must know the susceptibilities of the infecting organisms; he must understand the disease process, its natural history and the possible influence of antimicrobic therapy; he must be informed about the toxicity absorption, distribution, and excretion of the antimicrobics available for therapy. This paper will concern itself with the first point, ie, the susceptibility testing in the laboratory. This is now a major part of the workload of the diagnostic laboratory.

First, we must define the terms sensitive and resistant. The following criteria are suggested:

1) The organism is sensitive if it is inhibited by considerably less (by a factor of 2 to 4 fold) than the average blood levels attained with an ordinary dose. Conversely, resistance implies that the organism would not be effectively inhibited by blood levels attained with an ordinary dose. This does not take into account special situations such as the urinary tract where antimicrobials may be concentrated many fold.
2) A bimodal distribution of susceptibility often emerges as organisms within a species develop resistance to an antimicrobic. Strains that fall in the less susceptible population are considered resistant.
3) Clinical studies demonstrate a correlation between the response to therapy and the *in vitro* prediction of susceptibility.

These definitions do not take into account special host factors such as drug absorption and excretion, the drug level at the site of infection, or the role played by the host in controlling and eradicating the infection. In addition to the categories of sensitive and resistant, some laboratories provide an intermediate category. This implies that if the organism is present in the urine it may be eradicated by the urinary level of the antimicrobic.

As well as providing essential information for patient care, the laboratory obtains an additional bonus from sensitivity testing. Antibiograms have become important taxonomic tools that are used every day in pigeon-holing organisms. For example, how often do tetracycline-sensitive *Proteus mirabilis* occur? Also, these same criteria can play a major role as biologic markers in studying the epidemiology of hospital infection and may be more readily available than phage typing for labelling common hospital pathogens such as *Staphylococci.*

This paper will not go into methodologic details. However, regardless of the techniques a few general principles apply to all techniques and bear repetition. First, studies can only be done on pure cultures. It is grossly

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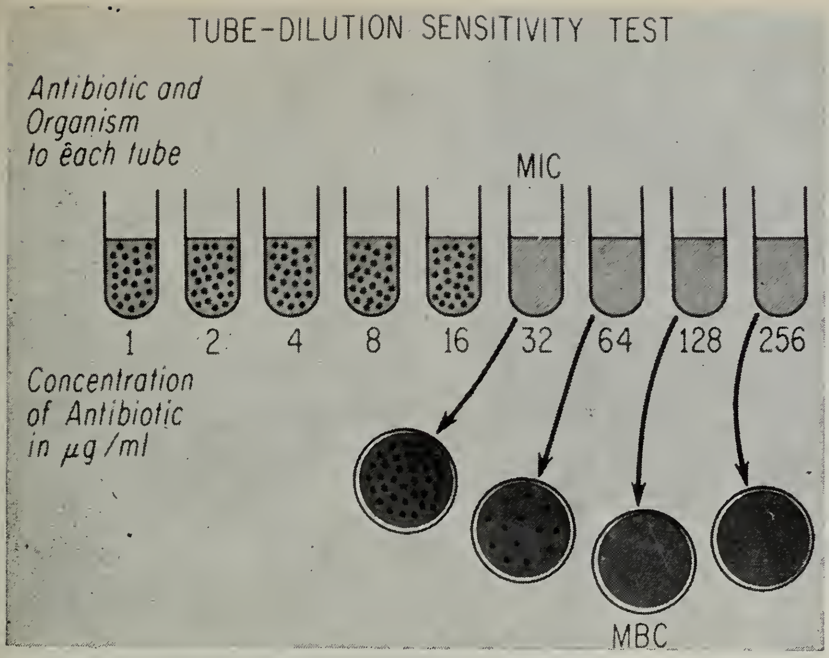
TUBE-DILUTION SENSITIVITY TEST
Antibiotic and Organism to each tube
MIC
1
2
4
8
16
32
64
128
256
Concentration of Antibiotic in µg/ml
MBC

Figure 1

Pictorial depiction of the tube dilution susceptibility test.

misleading to report sensitivities based on discs placed directly on streaked specimens except in instances in which a pure culture of the pathogen can be anticipated. Second, for routine sensitivity testing to be reproducible in any laboratory, careful quality control is required. This must include the media and the antimicrobics as well as the conditions of the test method. Third, a well standardized, widely adopted procedure should be used for routine work. Any changes in the media, inocula or other methodologic detail will alter the interpretative criteria of the method and must be carefully evaluated before being placed in routine use. Unfortunately, the lack of standardization of sensitivity methods has resulted in great variations in results from laboratory to laboratory. This problem will be solved only if physicians and microbiologists insist that sensitivity procedures be widely standardized and uniform across the country.

Methods for In Vitro Sensitivity Testing

Three commonly used methods for *in vitro* sensitivity testing are available.

The broth dilution technique is depicted in Figure 1. The dilutions of antibiotic are prepared to cover a meaningful clinical range. A standard inoculum of organism is added to each tube. After incubation, usually overnight, the lowest concentration of antibiotic that inhibits the organism is called the minimum inhibitory concentration or MIC. Subcultures from the tubes that initially appear clear, that is showing inhibition, are made to determine the minimum bactericidal concentration or MBC. Automation of the broth dilution in a microtiter system has been developed in several laboratories and may make this a more routine test.

Figure 2 depicts the agar dilution method. Antibiotics, in this case ampicillin, are diluted in solid media so that each plate represents one concentration. The MIC is read at the lowest concentration which prevents growth.

Both these dilution methods are useful, and one of them should be available in every microbiology laboratory. They do provide a number which is intended to relate to the level of antimicrobic in the patient. Unfortunately, these methods can give varying results depending on the conditions of the test situation. Also, it is impossible to reproduce in the test tube the *in vivo* conditions that may obtain in a particular lesion.

Most laboratories depend for routine sensitivity testing on the agar disc diffusion meth-

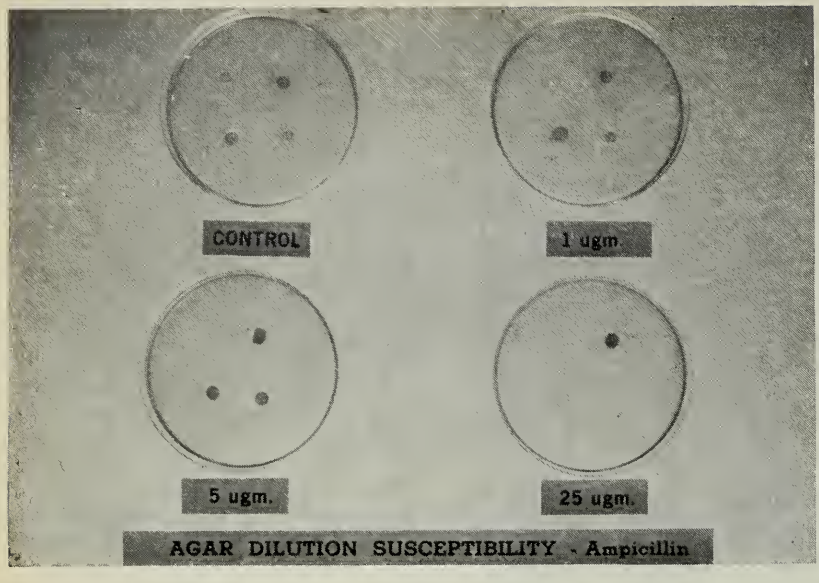

Figure 2

Agar dilution susceptibility with four organisms with varying resistance to ampicillin.

od. This test is convenient, and readily performed, and well standardized methods are available. An agar plate is seeded with the organism and discs placed firmly on the agar. The antibiotic in the disc diffuses into the surrounding agar, inhibiting the growth of the organism. This results in the zones of inhibition around the disc. The size of the zone depends on a great many factors including the amount of antibiotic in the disc, the diffusibility of the drug, the susceptibility of the organism, and its rate of growth. This is shown in Figure 3.

Figure 4 depicts the relationship between the zone of inhibition plotted on the abscissa and the $\log_{10}$ of the MIC plotted on the ordinate. For any given drug, there is an approximate linear relationship between these two values. That is, the disc diffusion test performed in a standardized manner provides quantitative information, and an estimation of the MIC of the organism can be made. However, the diameter of the zone of inhibition around one antimicrobic cannot be compared with the size of the zone of inhibition of other antimicrobics. Each drug must be standardized for itself. Also, the amount of antimicrobic in the disc does not in any way relate to the MIC of the organism. For example, a zone around a 10 unit penicillin disc does not imply that the organism is susceptible to 10 units.

Guidelines for Selection of Organisms

General guidelines for selection of organisms for antimicrobial sensitivities include the following:

1) Organisms thought to be responsible for specific infection should be tested. Sensitivity tests should not be done on organisms that are a part of the normal flora and are not acting as pathogens in the clinical setting. In some laboratories, personnel may have considerable responsibility in deciding the organisms to be tested for antimicrobial sensitivity. Results reported on normal flora may lead to useless and even dangerous treatment by suggesting that these organisms have an etiologic role in the infection.

2) Routine sensitivities are not required on organisms with predictable sensitivity patterns. This includes pneumococci, group A streptococci, gonococci, and meningococci. However, even here survey studies should be done every few years to ascertain that this pattern has not changed. Also, whenever an infection presumed to be due to a uniformly sensitive organism fails to respond to that antibiotic, sensitivity tests are indicated. During the past few years, these methods have detected the emergence of resistant organisms on a number of occasions. For example, patients

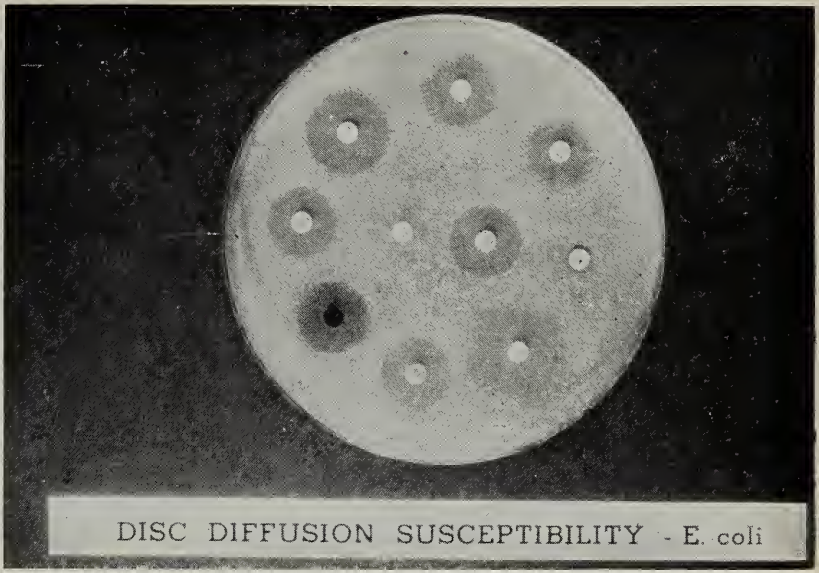

Figure 3

Agar diffusion susceptibility test on 150 mm. Petri plate using the Kirby-Bauer technique.

with pneumococcal pneumonia failing to respond to tetracycline have been discovered in retrospect to have infection with tetracycline resistant *D. pneumoniae.* Surveys have subsequently defined that about 10% of group A streptococci and 3% of pneumococci are resistant to tetracycline. The discovery of sulphonamide resistant meningococci and penicillin resistant gonococci followed a similar pattern.

3) Organisms that develop resistance rapidly on exposure to antibiotics should be tested prior to therapy and again if isolated during therapy. Some antimicrobics permit rapid emergence of resistance. For example, in about 20% of patients treated with nalidixic acid, the pretherapy sensitive organism becomes resistant.

Selection of Antibiotics

The spectrum of antimicrobics to be routinely tested will vary from area to area and should be developed jointly between the clinicians treating patients and the laboratory director. The following antimicrobics are used routinely in the Winnipeg General Hospital.

Staphylococcus aureus: Sensitivities should be routinely performed whenever it is considered to be a pathogen. The following antimicrobics should be routinely tested:

	% resistant
— penicillin (ampicillin not necessary)	60
— a penicillinase resistant penicillin (oxacillin)	rare
— cephalothin	rare
— erythromycin	10
— lincomycin	2
— tetracycline	15
— kanamycin	3
— vancomycin	100

Staphylococcus epidermidis: This organism is occasionally a pathogen. It is a problem in sepsis from intravenous catheters. The same antimicrobics as for *S. aureus* should be tested. Oxacillin (methicillin) resistance is much more common and occurs in 5 to 10%.

Non-group A streptococci (includes enterococci): These organisms require routine sensitivities if thought to be a pathogen. Recent tests of enterococcus reveal that 70% are resistant to penicillin and cephalothin, 20 to 30% are resistant to erythromycin, tetracycline, and nitrofurantoin and rare strains are resistant to ampicillin.

Clostridium species: Routine sensitivity testing is unnecessary as they are predictably sensitive to the penicillins, cephalosporins, erythromycin, and tetracyclines and resistant to the aminoglycoside antimicrobials.

Gram negative species other than Pseudo-

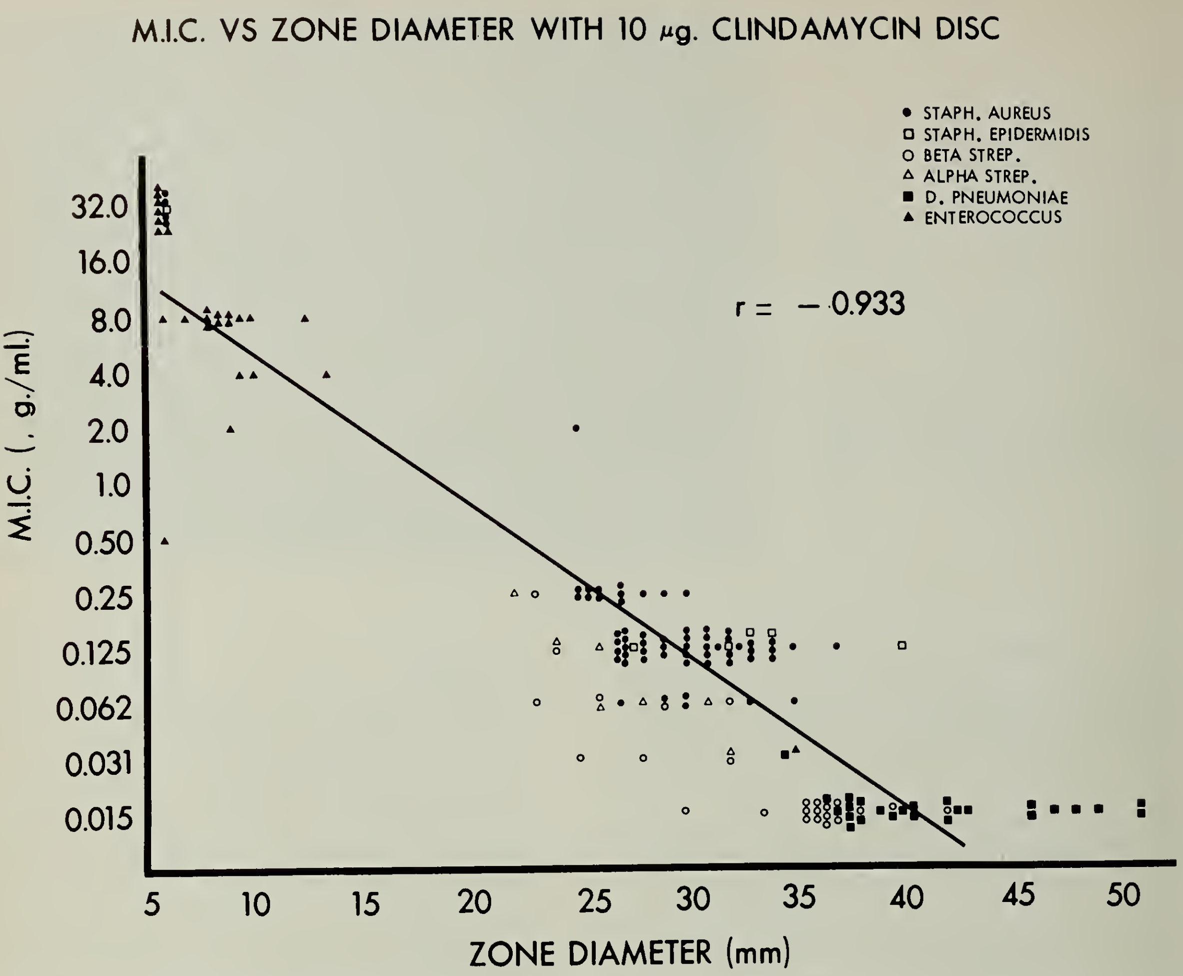

Figure 4 — Comparison of antibiotic discs and agar dilution tests of susceptibility with clindamycin.

monas: These organisms should be tested with ampicillin, cephalothin, tetracycline, chloramphenicol, kanamycin, and gentamicin. Nitrofurantoin, nalidixic acid, and sulphonamide should be included only if the organism is from the urinary tract.

Pseudomonas aeruginosa: This organism is predictably resistant to cephalosporins, ampicillins and nalidixic acid. It should be tested against tetracycline, chloramphenicol, gentamicin, carbenicillin, sulphonamide, and polymyxin or colistin.

Miscellaneous Organisms

a. *Neisseria meningitidis* are predictably sensitive to penicillin. However, sulphonamides remain the only effective antimicrobial for eradicating the carrier state. At present, at least 50% of meningococci are sulphonamide resistant. Bennett[1] has shown that sulphonamide sensitivity determined with a disc technique on Mueller-Hinton agar can accurately predict sensitive organisms and correlate with the agar dilution technique.

b. *Neisseria gonorrhoeae* have gradually become more resistant to penicillin. Sensitivity tests preferably by the agar dilution method are indicated in patients who have failed to respond to penicillin.[2] Fortunately, with a dose of 2-4 million units of penicillin, a cure is still effected in over 90% of the patients. At present, the tetracyclines are the alternate drug of first choice.

c. *Listeria monocytogenes:* These organisms are predictably sensitive to ampicillin and tetracycline.

d. *Hemophilus influenzae:* These organisms are predictably sensitive to ampicillin, chloramphenicol and tetracycline, and routine sensitivity tests are not indicated. Surveys should be done periodically.

e. *Anaerobic gram negative rods* (*Bacteroides*) have been predictably sensitive to chloramphenicol. Most strains originating in the mouth are sensitive to penicillin or ampicillin. Tetracycline has been a most useful drug, but at present resistance to this antimicrobic is not unusual. Lincomycin and more recently clindamycin and vancomycin have been used successfully to treat patients with these infections. Unfortunately sensitivity tests with these organisms are difficult and have not been well standardized. The diffusion tests can be used with organisms that grow well enough within 24 hours to determine zones of inhibition.

The physician is under constant pressure to use newer antimicrobics. The laboratory is also often coerced into using the discs of these newer agents so that the physician will be presented with the sensitivities for the wonderful new agent "Marvelomycin." The decision as to what antimicrobics should be tested in the laboratory should be made by both the clinicians and the microbiologist. The antimicrobics chosen should have been shown to be effective in reputable clinical studies, and *in vitro* criteria for sensitivity testing should have been well worked out. The laboratory shares the responsibility with the physician if patients are treated inadequately because improper antimicrobics are selected.

Of the ordinary penicillins, only penicillin G need be tested. Only one of the semisynthetic penicillinase resistant penicillins should be tested. Oxacillin is more stable than methicillin, and with the disc method oxacillin has been shown to better predict staphylococcal resistance to the penicillinase resistant penicillins.[3] Carbenicillin sensitivities should be performed for *Pseudomonas*. This new semisynthetic penicillin has increased the antibacterial breadth of the penicillin family by including many strains of *Pseudomonas*, the indole positive *Proteus*, and some *Enterobacter* in its spectrum. Criteria for interpreting disc sensitivities still remain to be established and for the present, dilution sensitivities are being used.

Cephalothin discs can be used for all the cephalosporins. Erythromycin and lincomycin are both useful agents in coccal infections and merit sensitivity testing.

Only one of the tetracyclines, preferably tetracycline itself, should be tested. There is no logical reason for reporting sensitivities to doxycycline, methacycline and demethylchlortetracycline. To do so only confuses the physician and wastes laboratory time.

Chloramphenicol sensitivities should be restricted to the gram negative organisms and its use discouraged except in specific indications such as typhoid fever.

The aminoglycoside antibiotics, kanamycin and gentamicin, have become very important therapeutic agents in the treatment of gram negative infections. Streptococci and all anaerobics are predictively resistant, and when they are used in the treatment of very ill patients with undiagnosed infection, this must be kept in mind. When gentamicin was first introduced, resistant *Enterobacteriaceae* or *Pseudomonas* were essentially non-existent. At present, in the Winnipeg General Hospital where gentamicin has been widely used for four years, gentamicin resistant *Enterobacteriaceae* are rare, but about 5% of *Pseudomonas* are resistant. The emergence of organisms resistant to this antibiotic needs to be carefully monitored in order to forestall the emergence of widespread gentamicin resistance.[4]

Sulphonamide sensitivity testing continues to be criticized despite several excellent studies showing clinical correlation with *in vitro* sensitivity. Media free of sulphonamide inhibitors (eg, Mueller-Hinton agar) should be used and the same criteria applied as in other sensitivity testing.[5]

Nitrofurantoin and nalidixic acid sensitivities should be performed on gram negative organisms isolated from urine. The sensitivity tests with these drugs are based on urinary drug levels.

Methenamine mandelate is a clinically useful agent in the prevention of recurrent urinary infection but has a more limited role in the treatment of infection. As it is only active at an acid pH, sensitivity studies are of no value and should not be done.

Occasionally, the laboratory is requested to perform sensitivity tests with combinations of two or more antimicrobials. Fortunately, these are not used as frequently as in the past and at present should only be done in special situations such as enterococcal endocarditis. Various combinations of penicillin and streptomycin or ampicillin and streptomycin should be tested using a tube dilution technique with subcultures to give bactericidal end-points.

In conclusion, we need to be continually reminded that the laboratory's task is not complete until the physician caring for the patient has the results of the work. This frequently requires personal communication in order that delays in effective therapy do not occur.

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ROBERT KOCH (1843-1910)

If we are continually guided in this enterprise by the spirit of genuine preventive medical science; if we utilize the experience gained in conflict with other pestilences, and aim, with clear recognition of the purpose and resolute avoidance of wrong roads, at striking the evil at its roots, then the battle against tuberculosis cannot fail to have a victorious issue.

The Fight Against Tuberculosis

HILAIRE BELLOC (1870-1953)

The Microbe is so very small
You cannot make him out at all,
But many sanguine people hope
To see him through a microscope.
His jointed tongue that lies beneath
A hundred curious rows of teeth;
His seven tufted tails with lots
Of lovely pink and purple spots
On each of which a pattern stands,
Composed of forty separate bands;
His eyebrows of a tender green;
All these have never yet been seen —
But Scientists, who ought to know,
Assure us that they must be so. . . .
Oh; let us never, never doubt
What nobody is sure about!

Cautionary Verses, "The Microbe"

PREVENTION AND TREATMENT OF RESPIRATORY VIRAL INFECTIONS IN CHILDREN

• **The outbreaks of viral respiratory infections in Australia closely resemble those that occur in the United States. Influenza vaccine and amantadine have been shown to be effective in preventing influenza.**

Stanley W. Williams, M.D.

As a pediatrician, one has the impression that in most respiratory infections of childhood, the cause is not known and defies detection by the most modern laboratory techniques. A "cold" can be due to one of four prevailing viral infections in our community — parainfluenza, adenovirus, respiratory syncytial virus (R.S.V.), or Coxsackie B. A streptococcal infection of the throat can cause similar symptoms. The trigger mechanism for most cases of bronchial asthma is also unknown, and could be related to viral infection.

Although the known respiratory viruses tend to cause typical syndromes, Stuart-Harris[1] states none is specific for a particular clinical syndrome. Chanock[2] and more recently Gardner[3] have defined the roles of parainfluenza viruses in the causation of croup and bronchiolitis. The significance of the isolation of a virus in the course of an illness concerns us as to whether the virus is a pathogen. Gardner[3] states that parainfluenza and R.S.V. are seldom isolated except when the patient has symptoms. There are many viral respiratory diseases for which we have no cure or prevention, and on the other hand, there seem to be potential chemotherapeutic agents for which there is, so far, no appropriate disease.

Some epidemics and sporadic endemic respiratory viral infections are reasonably clarified, even if unpredictable, and this applies particularly to influenza viral infection. With the approach of winter in Australia, considerable thought is being given to the necessary steps to cope adequately with the likelihood of viral epidemics, especially influenza.

Prediction

Except in 1957, when the epidemic of A_2 Asian influenza in Australia preceded that in the United States, our epidemics follow the pattern of those in the United States and Europe. As influenza A_2/Hong Kong has been present in Australia each year from late 1968 to 1970, it is unlikely this will recur in 1971. As you know, influenza B has occurred recently in the United States[4] with the absenteeism from some schools reaching 20 to 30 per cent, indicating sporadic epidemics, and possibly that is what will happen in Australia. Of considerable interest has been the incidence of 36 cases of hepato encephalopathy (Reye's syndrome).

There were a few isolations of influenza B in Melbourne towards the end of winter in 1970, and this virus could be endemically dormant in our community — or it will flare up by contacts from outside the country. Australia last had an influenza B epidemic in 1965, so that children under the age of six years will be susceptible and could possibly benefit by immunization.

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Prevention

Immunization is only one approach to the control of disease, and when effective, it applies well to influenza. A Commonwealth Serum Laboratory product called influenza virus (sub-unit) vaccine 1971 is our standard vaccine. It is similar to some brands available in the United States. This vaccine was developed following the discovery by Webster and Laver[5] at the Australian National University that in experimental animals sodium deoxycholate abolished the toxicity of suspensions of influenza viruses without significant loss of antigenicity. The deoxycholate dissolves the lipids in the virus envelope while the surface antigens associated with infectivity are released in the form of sub-units. Influenza virus (sub-unit) vaccine is prepared by treating formalin inactivated virus vaccine with sodium deoxycholate. Our experience in organizing the first trials of this vaccine in infants with my colleagues, M.F. Warburton and Reuben Glass,[6] showed it to be non-reactogenic and antigenic. The same was found in adult volunteers.[7]

Composition of Vaccine

The vaccine contains 660 chick cell agglutinating (CCA) viral sub-units from the following strains of Influenza Virus Types A and B:

Influenza Virus Type A_2 Hong Kong Subtype (Strain A_2/NT/68)
Influenza Virus Type B (Strain B/Victoria/65)
Influenza Virus Type B (Strain B/Rome/67)

There is no doubt this vaccine causes fewer reactions than those previously used in Australia, and the only contra-indications are in a subject who is sensitive to egg albumin.

How Effective is the Vaccine?

Numerous trials, particularly by the United States Armed Forces Commission on Influenza, have demonstrated good protection against the natural disease. The World Health Organization (W.H.O.) believes that a suitable vaccine is indicated if a pandemic is threatened.

The warning system of the W.H.O. program functioned well with regards to the pandemic of A_2/Hong Kong influenza in 1968. Large amounts of vaccine were produced, but utilization was sub-optimal.[8]. When a second wave of the epidemic occurred one year later, there were 20,000 excess deaths in the United States, and a similar situation prevailed in Europe. Does this 1968-69 experience in the United States represent failure of antigens or failure of the strategy of immunization?

The answer is not just yes or no. Davenport and others[8] express the concept that community immunization programs could limit the spread of influenza virus.

Dr. A. A. Ferris,[8] former Director of the Virus Research Laboratory at Fairfield Hospital, reported that in the 1969 A_2/Hong Kong epidemic in Melbourne, over a two-month period, 96 patients were confirmed virologically, 84 patients by virus isolation, and 12 by serology alone. Twenty-eight of these 96 adult patients (29 per cent) had received the currently available vaccine. There were six deaths, four of whom had no pyogenic super-infections but died of classical influenza pneumonitis. None of the four persons who died had been vaccinated. These deaths were a rare and frightening phenomenon to us, but fortunately only occurred in a small number, and there were few deaths in children, with possible exception of a few cot deaths, in infants. The epidemic in 1969 was widespread, as shown in a sampling of 100 non-vaccinated blood donors — 52 per cent had antibody. This was similar to the 45 per cent found in the 1957 A_2 epidemic. There was quite a lot of very mild and subclinical A_2/Hong Kong influenza in Melbourne in 1969, yet in 1970, there was another epidemic with the same virus, with over 100 patients in hospital from whom a virus was isolated.

There is little doubt in the minds of clinicians that both in private and hospital practice, many lives were saved by the effective use of antibiotics during these influenza epidemics.

In Australia, the official view remains that vaccination with a current strain of vaccine is worthwhile, and gives up to 70 per cent

Table 1
Results of a Trial of Amantadine to Prevent Influenza A Infection in Children

	Amantadine	Placebo	Totals
Number at risk	49	45	94
Number infected with A_2 during trial	17(35%)	20(45%)	37(40%)
Number of A_2 infections hospitalized	2(12%)	8(40%)	

protection. In spite of this, some authorities doubt the value of vaccine, both for individual protection and for the slowing down of an epidemic. The reason for the failure of vaccine is perhaps that it does not produce local respiratory tract surface immunity (IgA).

It was shown in the amantadine trial in Melbourne that the 1968 A_2 Asian epidemic in children, although affecting 35 to 40 per cent, was a comparatively mild disease in that age group. Because of the dramatic pandemics of influenza in 1918, we are inclined to be too apprehensive about the expected epidemics, and the study in children in 1968 showed influenza to be no more serious than some other viral epidemics.

The National Health and Medical Research Council in Australia recommend vaccination in the following order of priority: (1) pregnant women; (2) children 1-5 years of age; (3) persons with chronic debilitating disease; and (4) persons over 65 years of age. (These persons should be immunized against influenza, and their immunity maintained with a yearly booster dose.) In addition, if an epidemic is threatened, vaccination should be performed on (1) persons in medical services and public utilities or communications; (2) persons in whom the incidence of infection is highest, namely aged 5-25 years; and (3) patients in nursing homes or chronic disease hospitals. Vaccine is not available on our National Health Scheme as a pharmaceutical benefit, except for pensioners.

There is no disquiet in Australia at the moment regarding the prospects of a severe epidemic of influenza B virus, but the manufacturer of the vaccine is alerting doctors, some of whom have started to immunize. There has been no direction from the public health authorities as yet, presumably awaiting the full reports of epidemics in the northern hemisphere.

Other Vaccines

Vaccination against influenza is at present still unsatisfactory, and live influenza vaccine may yet prove to be more effective. In the United Kingdom,[9] work has continued on the development and testing of live attenuated influenza A_2 strains for intra-nasal administration. The tissue IgA is raised by this method. Interferon production may make it more protective. The practical results so far are not very promising. However, in the USSR, 20-30 million doses annually of live influenza vaccine have been administered by the intra-nasal route. The oral route may also be effective.

Dr. Voroshilova[8] stated that entero viruses are effective interferon inducers, and in field trials the incidence of influenza was reduced in groups who had received oral Type 1 polio vaccine.

A report by Dr. Woodhour[8] and associates suggested that Adjuvant 65 influenza vaccine was associated with increased anti-influenza antibody in nasal secretions. There is some doubt as to the oncogenicity of the mineral oil adjuvants.

Chemoprophylaxis with Amantadine

The important discovery of amantadine in 1964 has been well ventilated in this city and elsewhere.[10-12] A. A. Smorodintsev[8] and others showed in volunteers that amantadine was effective against the Hong Kong, as well as other strains of A_2. Unfortunately, it is not effective against influenza type B.

A double blind trial in children was carried out under my supervision in Melbourne at the start of the expected epidemic in 1968 of A_2

Asian influenza. The children selected were inmates of a child reception center, aged one to fourteen years. The children taking part had blood samples taken before the commencement of the drug. A second specimen was obtained ten weeks later, after cessation of amantadine. Viral, nasal and throat swabs were taken at the start and at intervals during the epidemic. Any infant or child who seemed sick was admitted to hospital, the decision being a "common sense" one, applying both to children on amantadine and on placebo.

Results

The figures seen in Table I are not statistically significant (p- .058). It was concluded, however, that our findings were consistent with the degree of protection shown in reported experimental trials in adults, and that amantadine is an effective prophylactic against A_2 influenza. In our experience the disease in children was not sufficiently severe to warrant its use routinely. It could be useful in debilitated patients. In most children infected the disease was mild and no special treatment was required. In more severe cases, although the symptoms may well have been due only to the virus, the accompanying pyogenic infection, which occurred in many cases, required an antibiotic.

Pyogenic Infection

One of the outstanding deficiences in our knowledge is the incidence of pyogenic complications in viral infection. It is known that 50 per cent of people carry potential pathogens in their nose, throat or ear. Pneumococcal infection is the commonest complicating infection and is adequately handled with penicillin and other drugs, such as lincomycin, erythromycin, and the cephalosporins. The same applies to streptococcal infection.

During the A_2 influenza epidemic in 1957 in Melbourne, a number of infants and older children in the community were infected with penicillin resistant staphylococci, producing severe staphylococcal penumonia, and there were 20 deaths due to this cause. This calamitous experience has influenced our therapy to such an extent that since then one has used in severely ill patients erythromycin, lincomycin, or chloramphenicol. Tetracycline has been used a great deal in older children and adults. Both chloramphenicol and tetracycline can be combined with penicillin to make sure streptococci are well covered.

The purely viral pneumonia in children is seldom severe enough to be fatal. One infant died at the Royal Children's Hospital, and the post mortem findings were typical of viral pneumonia. The very severe cyanotic moist pneumonia, which occurred in four adults, defied all attempts of modern oxygen and resuscitation therapy.

Respiratory Syncytial Viral Infection

This virus is a frequent cause of severe respiratory infection in infants. Epidemics occur almost annually, and vaccines not only do not prevent the disease but can make it worse by means of a sensitivity phenomenon in the lungs.[13] Most cases are not helped by antibiotic therapy, and some authorities even condemn antibiotics in R.S.V. infection, but one fails to agree with this attitude because it is sometimes difficult to be certain if the infant has a purely viral condition. In therapy, oxygen is of paramount importance.

In Melbourne we have had an epidemic of R.S.V. with chiefly bronchiolitis in infants, every winter since 1960, with the exception of 1965. Last year there was a sudden epidemic in a neonatal nursery, but no deaths. Fluorescent antibody smear tests have been described for diagnosis by Gardner.[14]

Parainfluenza Virus — Prevention

Vaccines are under investigation for prevention of this virus infection. The importance of local nasal antibody has been stressed in regard to influenza, and probably also applies to parainfluenza.

These viruses, Types 1, 2, 3, are common causes of croup in children in Australia, and probably cause other respiratory syndromes in older patients. Diagnosis of the virus involved can be helped with fluorescent smear tests.[3]

Patients admitted to hospital are usually given antibiotics, and a broad spectrum approach with chloramphenicol is preferable in serve cases. In the care of the respiratory obstruction, steam tent therapy is standard. When indicated, intubation or tracheostomy is performed.

Adenovirus

Adenovirus is a common cause of respiratory infections, and the one currently present in Melbourne is Type 1. Occasionally, mixed viral infections such as measles and adeno virus Type 3, have produced a very sick patient with pneumonia.

Conclusion

The advanced techniques in the viral laboratories have shown the clinician there are at least 120 known respiratory viruses and strains. These can cause a variety of clinical syndromes. We now have a greater understanding of the mechanism of recurrent respiratory infection in children and an explanation why children are seldom well for lengthy periods.

Immunization is still worthy of consideration against influenza virus infection although the vaccines available are not ideal. Amantadine is an effective prophylactic against influenza A_2 virus. Antibiotics reduce morbidity and mortality due to pyogenic infections associated with these viral infections. Having practiced pediatrics before the antibiotic era, the author acknowledges the tremendous value of antibiotics in the care of children with respiratory infection.

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HILARY KOPROWSKI (1916-)

If a universal antibiotic is found, immediately organize societies to prevent its use. It should be dealt with as we should have treated, and did not treat, the atomic bomb. Use any feasible national and international deterrents to prevent it falling in to the hands of stupid people who probably will still be in the majority in your time as they were in mine.

Man and His Future (ed. by Gordon Wolstenholme), "Future of Infectious and Malignant Diseases"

JOSEPH, LORD LISTER (1827-1912)

Since the antiseptic treatment has been brought into full operation, and wounds and abscesses no longer poison the atmosphere with putrid exhalations, my wards, though in other respects under precisely the same circumstances as before, have completely changed their character; so that during the last nine months not a single instance of pyaemia, hospital gangrene or erysipelas has occurred in them.

As there appears to be no doubt regarding the cause of this change, the importance of the fact can hardly be exaggerated.

British Medical Journal 2:246, 1867

THE TREATMENT OF TUBERCULOSIS AND MYCOBACTERIAL PULMONARY DISEASE

• Continuing rapid advances in the diagnosis and treatment of tuberculosis require frequent review of this subject to assure proper management of the infected patient.

J. Woodrow Savacool, M.D.

Through the ages tuberculosis was known in various forms but was not well organized as an entity until the last two decades of the nineteenth century when its etiology was discovered and it became possible to observe its epidemiology. This led to efforts at prevention and control, which before long began to make inroads into its morbidity and mortality. Groups of persons other than physicians soon played an important role in dissemination of knowledge of the disease. The voluntary agencies which resulted provided a model for public efforts in many areas of disease control. In coming to Delaware to discuss tuberculosis treatment, one cannot help but refer to the role played by Delaware people in organizing the public for its part in publicity, public education and fund raising. The work of Emily Bissell and her Christmas Seal paved the way for the more recent efforts of people like Dr. Beatty whose memory is honored here and whose leadership in the anti-tuberculosis movement depended greatly on the groundwork laid in the beginning of the present century.

Supplementing the principles of isolation of active cases, hygienic treatment, collapse therapy and case finding, the discovery of specific antituberculosis drugs provided a final weapon which made the hope of disease eradication a possibility. In our country there are now large areas relatively free of tuberculosis. There is still, however, a large reservoir of persons who harbor the tubercle bacillus, and the relatively high prevalence of tuberculosis in crowded and urban areas attests to the fact that we still have a long way to go to achieve the goal. For this reason it is still important to use effectively the skills and knowledge which have made control procedures so rewarding during the past two decades. It is also important to realize that, in many parts of the world, the modern tools of control and treatment have not been effectively applied and tuberculosis continues to be a major health problem.

The availability of effective drugs has produced a change in the logistics of tuberculosis treatment. Whereas formerly long-term isolation was a major need, most patients now show early conversion to non-infectious status, limiting both hospital stay and loss of time from work. Evidence has accumulated that bed rest, formerly the mainstay of treatment, is unnecessary and may be detrimental once the toxic phase of the disease is controlled. Surgical procedures, which were first brought within the limits of safety by anti-tuberculous

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drugs, are now rarely needed since experience has shown that residual lesions, including cavities, constitute less of a threat than was formerly believed. The need for specialized institutions therefore has diminished, and the need for better general hospital care of tuberculous patients, outpatient and laboratory facilities has increased. Recent recommendations of the American Thoracic Society Ad Hoc Committee on Quality Care for Tuberculosis[1] include availability of high quality medical care, an effective regimen of chemotherapy, microbiologic services, social and economic aid, and effective teaching of patients. Persons in whom the diagnosis of tuberculosis is suspected or confirmed are properly begun with treatment in general hospitals with the hope of continuing as outpatients once the immediate goals have been met and effective drug treatment initiated.[2,3]

Diagnosis

The fact that tuberculosis is often suspected for reasons other than presentation with specific symptoms at times requires that treatment begin without microbial confirmation. Collection of specimens for diagnosis should be carried out promptly with sputum smears and cultures and, in persons who cannot produce adequate specimens, by induction with saline or propylene glycol aerosol inhalation. Bronchoscopy for diagnosis and collection of secretions, pleural biopsy and fluid examination in cases of pleural effusion constitute other methods of procuring specimens for smear and culture. Once such efforts have been made and clinical judgment dictates tuberculosis as a presumptive diagnosis, treatment should be instituted. From there on, the diagnosis may be revised at any time new evidence is presented. There is a constant need to be critical of one's judgment so that treatment can be altered in accord with new developments.

The finding of acid-fast bacilli on smear must always be supplemented by typical growth on standard culture media. In every new culture, sensitivity studies for standard drugs are necessary even though in the United States 94 to 98% should prove sensitive.[4] Cultures not sensitive to primary drugs should automatically be studied for sensitivity to secondary drugs, and under most circumstances treatment should be limited to primary drugs until such reports are available. Since the laboratory procedures for secondary drug sensitivity are specialized, they should be carried out in a few central, specially oriented laboratories where skills have been properly developed. When cultures reveal mycobacteria not typical of tuberculosis, an alternative diagnosis and plan for treatment must be made.

Standard Treatment

It has long been my practice to begin treatment with three drugs, streptomycin 1 gm intramuscularly daily, isoniazid and aminosalicylic acid. Streptomycin is well tolerated generally except in older persons in whom vestibular symptoms are prone to occur early. Isoniazid is given in doses averaging 5 mg per kilo per day and constitutes the mainstay of antituberculous treatment. Para-aminosalicylic acid is mildly tuberculostatic, but its principal use is prevention of isoniazid resistance. The dose is 12 gm daily as the sodium salt, but it may be modified in the presence of mild gastrointestinal symptoms. About 80% of persons can tolerate this drug in standard dose with good medical and nursing instruction. In persons with extensive or acutely symptomatic disease the program is now preferably modified to employ ethambutol instead of PAS, thus providing three potent drugs from the beginning. When after the first several months sensitivity studies indicate that the bacilli are normally sensitive to primary drugs, streptomycin is usually no longer needed; and, providing clinical improvement is adequate, INH and PAS or ethambutol may then be continued for the long term.[5] The principal indices of clinical improvement must always be the x-ray and bacteriologic findings. It is not unusual for symptoms to diminish so rapidly that within three or four weeks sputum is no longer obtainable by usual means and recourse must be had to induced sputum or gastrics for bacteriologic control. It is our practice unequivocally to advise patients to stop smoking at the beginning of treatment of any pulmonary disease ("People with trouble in their lungs should not smoke").

If this is observed, it also tends to increase the rapidity of symptom disappearance.

Treatment of new cases of pulmonary tuberculosis thus should prove excellent when circumstances can be controlled. In several series, tubercle bacilli have been eliminated from the sputum in 90 to 95% of newly diagnosed patients within six months. The relapse rate among such persons should be very low providing the treatment program is completed as planned.

Between the primary and secondary drugs is ethambutol, studied experimentally for a long time and released by the FDA late in 1967. It is an excellent antituberculous drug and may replace PAS as an adjunct to isoniazid. At present experience with it is increasing, patient acceptance is better than for PAS, and when properly used its potential toxicity can readily be controlled. The proper dose is now 25 mg per kilo given in one daily dose for two months, after which the dose is reduced to 15 mg per kilo per day. In addition to the usual medical follow-up, eye examinations for visual acuity, color vision and visual fields are needed. In present dosage the incidence of ill effects is small and the early ones reversible. It is likely that the combination of INH and ethambutol will be increasingly frequently employed as a basic antituberculous treatment plan.

The group of drugs generally included among those regarded as "secondary" antituberculous ones are those possessing more limited antituberculous potential or more frequent and serious side effects. They may be listed as follows: cycloserine, pyrizinamide, ethionamide, kanamycin, viomycin and capreomycin. The skillful employment of secondary drugs requires careful attention to bacterial sensitivity patterns, good laboratory control and the potential side effects of each agent singly and in combination. The specific side effects of each agent are beyond the scope of this presentation, but in general a combination of three or more drugs is employed against bacteria resistant to the primary agents. In this country the need for secondary drugs is most commonly encountered among alcoholics, recalcitrant patients or those who have for other reasons had capricious or interrupted treatment or who have genetically determined inactivation of isoniazid. It is important to emphasize that resistance of bacteria to isoniazid is encouraged by injudicious or sporadic use in the presence of active disease especially under unsupervised circumstances.[6,7]

Many attempts have been made to determine the optimum time for total drug treatment. In some individuals with prompt bacteriologic conversion and x-ray retrogression, one has the impression that the battle is over early. However, treatment must continue well beyond the time required for stability. The Medical Research Council of Great Britain has established 24 months as the optimum period of basic therapy. I agree with this general program. In cases where bacteriologic conversion has been slow and much residual disease persists, uninterrupted drug treatment should be continued for at least three years and isoniazid may be extended for many months. In persons with complications of pneumoconiosis, alcoholism, duodenal ulcer and diabetes, isoniazid may be continued indefinitely for prophylaxis of relapse. Wherever treatment with secondary drugs has been successful, it has become standard procedure to continue that program for 24 months, and thereafter isoniazid may be extended for its preventive effect.

In any retreatment program, again the conversion of sputum and rehabilitation of the patients will depend mainly upon the disciplined completion of the planned program. Many reports are available which show a high percentage of patients experiencing sputum conversion even without rifampin. Using rifampin, ethambutol and capreomycin, Finnish investigators have reported 30 of 31 patients converted to negative in spite of previously having been classified as incurable because of drug resistance and drug intolerance.[8] There is thus much variation depending on the circumstances and previous treatment. There will no doubt continue to be a "hard core" of older persons with adverse factors in whom control will be difficult.[9]

An exciting new prospect is the imminent availability of rifampin, an antibiotic developed in Italy as rifamycin B obtained from culture media of *Streptomyces mediterranei.* Originally described in glowing terms in early European studies as effective against drug-resistant tubercle bacilli and atypical mycobacteria without toxic or side effects, it is now evident that these claims have been too sweeping. However, the recent report of controlled experimental studies carried out by the United States Public Health Service[10] suggests that rifampin can be safely employed and that isoniazid and rifampin may be the best combination of drugs for primary treatment of tuberculosis to date. 95% of patients in that study with far advanced cavitary disease showed elimination of tubercle bacilli from the sputum in 16 to 20 weeks of treatment. Although its place in treatment remains to be established, one may state now that rules similar to those governing other antituberculous agents must be applied to rifampin therapy. It may well achieve pre-eminent status as a first line drug when combined with isoniazid, but until further clinical experience has evolved, its major usefulness will probably be as a secondary drug combined with at least two other effective agents.[11] Two characteristics may be mentioned: (1) Its mode of action is by inhibition of DNA-dependent RNA polymerase activity in susceptible cells;[12] (2) it is highly concentrated in the liver and especially the bile, which may account for its tendency toward hepatitis-like toxicity in some individuals, especially those with other stigmata of hepato-biliary disease.

In present treatment programs, rifampin is given in the single daily dose of 600 mg one hour before breakfast.

Drug Reactions

Most persons tolerate antituberculous therapy well. However, the occurrence of tuberculosis in persons who are older, have other diseases and may be alcoholic increases the need for vigilance with respect to any drug treatment and especially combination drug treatment. These multiple factors have made more than usually difficult the evaluation of reactions to drugs, especially isoniazid. Hepatic toxicity from isoniazid and PAS in older persons has generally been attributed to PAS, but it is now known that a form of liver disease may occur with isoniazid alone.[13] As a general rule, however, reactions to isoniazid are mild, and when medical supervision is good, early detection and usually cancellation of the drug will prevent serious complications. Further, if hepatic and enzymatic changes do not occur during the first two months of treatment, prolonged use of the drug is regarded as safe. In view of the publicity accorded isoniazid reactions during prophylaxis of a Washington, D. C. group of exposed individuals, the United States Public Health Service and the American Thoracic Society[14] have reaffirmed the desirability of continuing well established therapeutic and prophylactic programs albeit with increased vigilance. It may be stated, however, that in any prophylactic program where persons present multiple factors which could contribute to reactions, one might judiciously evaluate the risk and conclude that in such persons the risk of drug prophylaxis might well outweigh the risk of tuberculosis. In older epileptics, for example, who have only moderate tuberculin reactions with negative chest x-rays, we have not given isoniazid prophylaxis. Pyridoxine for prevention of peripheral neuropathy has some status and is probably needed for older persons and those with other risks, but in younger individuals with standard doses of isoniazid, the need for it has not been established. It has become customary for some health departments to include 5 mg of pyridoxine in 100 mg tablets of isoniazid. When larger doses are employed or in special situations, 50 to 100 mg of pyridoxine should be given daily.

Ill effects from PAS are common, especially gastrointestinal symptoms. Usually it is possible to adjust the dose and timing of the medication to overcome them, but when such side effects are persistent, one should look for hepatic toxicity or other evidence of idiosyncrasy or hypersensitivity and begin an alternative drug program.

Streptomycin is generally well tolerated. Vestibular symptoms may occur early and require that the drug be stopped since, rarely, progression to hearing loss may occur. Drug fever and skin lesions are readily detected and also require cancellation. Persons with renal failure concentrate the drug unduly, and dosage must be adjusted or treatment changed.

In the past the disability relative to the treatment of tuberculosis and its infectious nature have been among its most devastating effects. Middle-aged persons who have been out of work for months or years have found it virtually impossible to return to gainful employment after such long lapses. Now the patient can usually return to work after a brief and intensive period of medication and teaching. Changes in careers are no longer necessary except when the problem is complicated. Moderately strenuous physical activity is permissible with regular hours of employment. Once cough and sputum and x-ray findings show significant improvement, it may reasonably be concluded that the program is successful, and the patient may return to work. It is often necessary, however, to overcome the traditional resistance on the part of personnel directors, physicians and nurses. In those cases where ideal circumstances do not pertain, duration of disability may be limited by rehabilitative programs which must begin during rather than at the end of the active treatment period.

Not all persons with active tuberculosis do well. Some already have other illnesses, others fail to cooperate, or special circumstances develop. Persistent cavities, residual from tuberculous ones, may remain in spite of sputum conversion. These are referred to as "open negative."[15] We have now observed more than one hundred of these, and it is possible to state that most of them do well provided bacteriologic conversion was prompt and clinical recovery otherwise complete. About 10% of those who do poorly develop fungus diseases, including mycetomata, in the cavities. These fungus balls are most commonly due to aspergillosis, and the principal hazard is hemorrhage. A few of the "open negative" relapse with recurrent positive sputum, and some show progression toward bullous emphysema which in itself may become disabling. In spite of these occasional complications, however, surgical resection of portions of lungs bearing such residual cavities is no longer generally recommended. There is a place, however, for surgical resection in a few special cases, especially in young persons and in those for whom it may not be possible to carry on appropriate follow-up treatment.

Mycobacteriosis

Although the atypical mycobacteria have been observed for many years, mainly the chromogenic ones, their clinical status has been enigmatic. Since we have specific drug treatment for tuberculosis, however, it has become important to establish the status of these mycobacteria as clearly as possible so that specific treatment might be used where applicable and undue concern over the less important bacteria be avoided. Some exist only as saprophytes and as such may be found in the presence of other pulmonary diseases without etiological significance; others are definitely etiologic. It has been possible in recent years to classify and evaluate the roles of these organisms to some degree. It is now preferable to regard disease produced by atypical mycobacteria as mycobacteriosis which, though exhibiting properties similar to those of tuberculosis, yet constitutes a somewhat different disease epidemiologically and therapeutically. An important distinction is that transmission of atypical mycobacteria from person to person has not been established. Although some strains are common in nature, the mode of human acquisition of the organisms is unknown. The important ones from the standpoint of human pulmonary disease have been grouped as follows:

Group I	Photochromogenic: *M. kansasii*
Group II	Scotochromogenic: *M. scrofulaceum*
Group III	Nonchromogenic: *M. intracellulare*
Group IV	Rapid growers: *M. fortuitum*

It is relatively uncommon to make a primary diagnosis of mycobacteriosis. Most commonly the diagnosis of tuberculosis is made because of x-ray findings and the presence of acid-fast bacilli on smears. Treatment with drugs is then begun, and only when the response of the patient is unusual or the cultures are reported does one suspect or prove that the process is not tuberculosis. A change in therapy may then be made depending upon the circumstances. It is important to acknowledge that it is not possible to differentiate the mycobacterioses from tuberculosis by x-ray or histological methods. The clinical course of mycobacteriosis is commonly characterized by a waxing and waning of lesions as shown by x-ray. This is especially so if the organisms are resistant to the treatment which has been instituted. The indolence of the lesions and the lack of communicability also remove some of the urgency about the management. Generally patients may work, and it is preferable to permit drug treatment or treatment change to await results of sensitivity studies. This again underlines the importance of distinguishing *M. tuberculosis* from the atypical mycobacteria and carrying through with all possible microbiological identification procedures including drug sensitivity studies.

I have collected 23 cases for observation although we have seen many more in whom studies are not complete. Of the 23, 13 are due to *M. kansasii* (Group I), 8 to *M. intracellulare* (Group III), two to Group II. In one case there were two species of atypical mycobacteria cultured and in two cases, three species. Generally those with several species have been more ill and have had other pulmonary problems. We have also experienced the occurrence of mycobacteriosis in persons previously having had a documented diagnosis of tuberculosis.

Several guidelines have emerged. In persons with previously established pulmonary disease such as pneumoconiosis, bronchiectasis or emphysema, it is relatively more common to have saprophytic mycobacteria which often belong to Group II or IV. In primary mycobacteriosis, the usual pathogens are *M. kansasii* and *M. intracellulare*, especially the Battey-Avium-Swine strain. Also generally *M. kansasii* may respond to ethambutol and cycloserine in combination although some strains are sensitive to streptomycin. If the latter is used, it should be given daily. The Battey strain is less likely to respond to drugs, and only occasionally are members of this group responsive to rifampin. Since some question the comparability of *in vitro* studies with clinical usefulness, it has been proposed that atypical infections might best be treated with combinations of ethambutol, cycloserine and ethionamide while awaiting the availability of rifampin. However, there is much to be said for not undertaking any new treatment program until one has the guidance of sensitivity studies since progression of the disease is usually slow and interrupted. It should be mentioned in passing that the penicillins and erythromycin have proven effective against certain strains of mycobacteria, but the place of these agents remains to be established. We have had one experience where penicillin in large doses appeared clinically effective against a disease produced by a strain of Group IV organisms. Also it has been shown, especially where disease is localized within one lobe, surgical excision may be the preferred treatment.[16] This is limited by the fact that these infections often occur in older persons in whom the surgical risk may be inordinate.

How much of a problem is mycobacteriosis? Our experience shows that one case is discovered for each ten or twelve new cases of tuberculosis, but statistics are difficult to clarify. It is not clear whether the disease is increasing in frequency or not, but the relative importance of these organisms has increased with the decreased incidence of new cases of tuberculosis. It is sufficiently important that we need to think of it in the differential diagnosis of chronic pulmonary disease generally.

Summary

1. Tuberculosis diagnosis and treatment are becoming increasingly the responsibility of practicing physicians and general hospitals.
2. Hospitalization now should be intended primarily for confirmation of diagnosis, initiation of specific treatment and teaching the patient.
3. Although the treatment of newly diagnosed tuberculosis is disarmingly simple, treatment failures and retreatment problems involving resistant tubercle bacilli

require care, precision and multiple drug therapy with attendant risk of intolerance and idiosyncrasy. Every effort must be made to assure success the first time.

4. Specificity of microbiological diagnosis is of major importance in management of all diseases produced by mycobacteria.
5. Rifampin may well prove an important new weapon for primary treatment once its indications and limitations have been established.

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THOMAS ADDIS (1881-1949)

We are accustomed to speak of "disease entities" as though they had an independent, individual existence and could be recognized as friends — or better, perhaps, as enemies. This is obviously one of those abstractions that do violence to the reality of the concrete situation, for there is no disease apart from the patient. The disease is the change produced in the patient by a pathological process. Diagnosis involves the observation of the patient as he is, and also a reconstruction in imagination of the patient as he was, before he was afflicted. The disease is the difference between these two pictures. But this, also, is an abstraction.

Glomerular Nephritis Diagnosis and Treatment, Ch. 1

ABRAHAM MYERSON (1881-1948)

To me man is a thickened node in the web of a universe of forces which, ever repetitively and ever anew, flow in and out of him; he is part of an ecology that involves plants, animals, climate, soil, and all kinds of radiant forces and chemicals. He is united by the invisible strands of heredity to every form of life that ever lived; and his fundamental drives and compulsive activities go back to the first piece of life that ever appeared on earth. He is packed with chemical factories, his every cell a better chemist and physicist than all the Nobel prize laureates put together. He is immersed in age-old and ever changing social forces that compress, enhance, destroy, or deform his trends. At every step he is beset by conflict between his biology and his sociology. . . . Somehow there is a constant and shifting balance of forces in which hormones, ferments, enzymes, memories, ideas, emotions, and moods all play a part; and all of this is an unexplainable transit from conception to that catalytic dispersal, perhaps reassemblage, called death.

Speaking of Man, Foreword

RECENT TRENDS IN THE MANAGEMENT OF HEPATIC ABSCESS

• An undiagnosed hepatic abscess is invariably fatal. A high index of suspicion should lead to the necessary diagnostic laboratory and radiologic procedures to permit specific surgical and antibiotic therapy.

WILLIAM A. ALTEMEIER, M.D.*

The obscure nature of hepatic abscesses with their lack of prominent localizing signs and their association with other more dominant diseases has frequently resulted in prolonged diagnostic delays or failures until serious complications or death occurred.[1-7] In our experience, hepatic abscess has been a life-threatening disease, and failure to diagnose and adequately drain these abscesses has invariably been fatal. Antibiotic therapy has been shown to be a valuable adjunctive agent in the pre- and post-operative control of these infections, but it has not prevented death when abscesses were not drained.[8,9] The recent utilization of new diagnostic techniques, however, has greatly improved the treatment and reduced the mortality of patients with this serious infection.[10-14] Earlier diagnosis and improved localization of hepatic abscesses have become possible preoperatively through the introduction and the use of radioisotope liver scans and arteriograms of the celiac axis. As a result, earlier and effective surgical drainage has thus become possible, and this has proven to be of considerable importance in the patients' survival. In contrast to previous reports, the last nine cases seen by the author during the past two years have been correctly diagnosed preoperatively and drained successfully with no mortality.

To obtain a better knowledge of the nature of these infections and to study the availability and effectiveness of the methods of their diagnosis and treatment, a study of all patients with hepatic abscesses who were seen on the Surgical Services of the University of Cincinnati Medical Center during the past 16 years has been made.

Materials and Methods

Cases of diagnosed and clearly documented liver abscess which were seen during the 16 years from January 1955 through January 1971 were included in this study. This case material was from the four hospitals of the University of Cincinnati Hospital Group: Cincinnati General Hospital, Cincinnati Veterans Administration Hospital, Christian R. Holmes Hospital, and Cincinnati Children's Hospital. In each instance the pathology was substantiated at operation or necropsy. Example of pyogenic, amoebic, echinococcal, and actinomycotic abscesses were found. In all, a total of 68 cases were studied, 61 being classified as pyogenic, four amoebic, two fungal and one echinococcal.

For purposes of comparison and discussion of the incidence, etiology, pathogenesis, diagnostic problems, effectiveness of treatment, morbidity, and mortality, this study was divided into three periods of five, five, and six years. (Table I) Further subdivision of the patients into two groups was based upon whether or not surgical intervention with

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Dr. Altemeier is Professor of Surgery and Chairman of the Department, University of Cincinnati.

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Table I
Incidence and Etiology of Liver Abscesses

(68 Cases)

Period	Pyogenic	Amoebic	Fungal	Echinococcal	Total
1955 - 1959	22	0	1	0	23
1960 - 1964	19	0	0	0	19
1965 - 1970	20	4	1	1	26
Total	61	4	2	1	68

drainage of the abscesses was or would have been beneficial. (Table II) The liver abscesses in 41 of the patients were found to have been amenable to surgical drainage (Group I) and 27 were not (Group II). The abscesses found in Group I were 1.5 cm or greater in diameter and were noted to be either solitary and discrete, or confluent. (Table III). The largest abscess contained 1200 cc of pus and measured 15 cm in diameter. Evidence of septicemia and multiple abscesses in other organs was usually absent in patients of this type. Those in Group II, however, were smaller and in some instances microscopic, being almost invariably multiple, and usually associated with septicemia documented by positive blood cultures. (Table IV) Abscesses in other organs were frequently present and multiple in this group.

Other categories studied were age, sex, race, microbial etiology, pathogenesis, clinical features, laboratory data, x-ray examinations, liver scans, and arteriograms. Attention was focused particularly on those factors which led to increased mortality and morbidity such as delay or failure in diagnosis, inadequate surgical operations, poor bacteriological culture techniques, or failure to detect and manage complications and associated diseases.

Results

Incidence The numbers of patients with liver abscesses occurring in the three periods of this study were 23, 19, and 26. (Table I) There were 34 patients with pyogenic abscesses amenable to surgical drainage (Group I), and their incidence was evenly distributed over the sixteen-year period. (Table II) The four cases of amoebic abscess and one of *echinococcus* disease all occurred in the most recent six-year period. Of the 27 cases not amenable to surgery, 13 were in the first five-year period, eight in the second, and six in the last six years.

Age The youngest patient in the total series was 12 days of age and the oldest 90 years of age, the average being 47.6 years. The majority of the patients in the total group were found in the first, seventh, and eighth decades. In the operable group these peaks were not evident, and almost equal numbers of cases occurred in each decade from the fourth to the eighth inclusive.

Sex and Race There were 48 males and 20 females. Forty-three patients were Caucasian and 25 Negro. The sex and race ratios did not vary in Group I and Group II from the total series.

Location and Nature of the Abscesses Of the 68 cases, 36 involved a single lobe, while 30 were bilateral and multiple. In two small abscesses identified at autopsy, the location was not specified. Of the 41 patients considered to be amenable to surgery, 26 had single abscesses and 23 of these were located in the

Table II
Incidence and Etiology of Liver Abscesses Amenable to Surgical Intervention

(Group I)

Period	Pyogenic	Amoebic	Fungal	Echinococcal	Total
1955 - 1959	9	0	1	0	10
1960 - 1964	11	0	0	0	11
1965 - 1970	14	4	1	1	20
Total	34	4	2	1	41

TABLE III

LOCATION OF LIVER ABSCESSES IN CASES AMENABLE TO SURGICAL INTERVENTION

(Group I)

Type	Right Lobe	Left Lobe	Bilateral	Total
Single (26 Cases)	23	3	—	26
Multiple (15 Cases)	2	4	9	15
Total	25	7	9	41

right lobe. (Table III) The last case seen was of special interest since it was characterized by an irregular coalesced abscess in the right lobe and multiple smaller abscesses 1-3 mm in diameter throughout both lobes. Of the 27 patients with bilateral and multiple abscesses, 21 fell into the non-operable group. (Table V)

Clinical Picture In Group I, the most commonly noted signs were temperature elevations in 95 percent, hepatomegaly in 51 percent, abdominal tenderness in 51 percent, and jaundice in 28 percent. Abnormal chest findings contiguous to the area of the hepatic disease were noted in 20 percent of the cases. The majority of the temperature elevations ranged between 102 and 106 F. Equivalent numbers of patients had elevations between 104 and 106 F. as had elevations between 102 and 104 F. The typical spiking temperature course observed is well illustrated in Figure I. Abdominal pain was the most common symptom noted. Chills were noted in only nine cases or 22 percent. (Table VI)

The clinical features of the cases in Group II with multiple abscesses not amenable to surgery were usually related to the non-specific signs of sepsis or to a remote primary disease process.

TABLE IV

LOCATION OF LIVER ABSCESSES IN CASES NOT AMENABLE TO SURGICAL INTERVENTION

(Group II)

Type	Right Lobe	Left Lobe	Bilateral	Total
Single	1	1	—	4*
Multiple	1	—	22	23
Total	2	1	22	27

*In two small abscesses identified at autopsy, location was not specified.

Laboratory Data The average white cell count for the 68 patients was 20,900 with the highest count being 61,600 and the lowest being 2,500. Patients with known blood disorders such as leukemia were not included in the tabulation. The average hemoglobin recorded was 11.4 grams and the average hematocrit was 33.4 percent.

Of special interest were the abnormal serum albumin, alkaline phosphatase, and bilirubin liver function studies. The serum albumin was 3.0 grams percent or less in 76 percent of the cases, and the alkaline phosphatase was elevated in 74 percent. Although bromsulphalein retention was measured in only ten patients, it was abnormal in all but one. Fifteen of 41 patients with operable abscesses had an elevated bilirubin. Thirteen of these had associated disease of the extrahepatic bile ducts and elevated alkaline phosphatase levels. The SGOT and SGPT measurements were normal in most instances.

Radiologic Examinations X-ray examinations were of only limited value in the diagnosis of hepatic abscesses. Intravenous or oral cholecystograms, obtained in eight patients, did not produce visualization of the gall bladder or biliary tree in any. In five cases marked jaundice was present, however, and the presence of biliary tract disease was subsequently confirmed in each of these.

X-rays of the chest were found to be abnormal in 19 instances and were related to the position and size of the abscesses present. (Figure II) In eight patients the appropriate diaphragm was elevated, and in 12 cases pleural effusion or pulmonary infiltrate was noted adjacent to the hepatic disease. The chest film appeared to be completely normal in ten cases, however.

An upper gastrointestinal series was performed in nine patients and was found to be abnormal in eight. A mass lesion was suggested in the liver in one case in which an abscess of the left lobe enlarged the liver sufficiently to compress the lesser curvature of

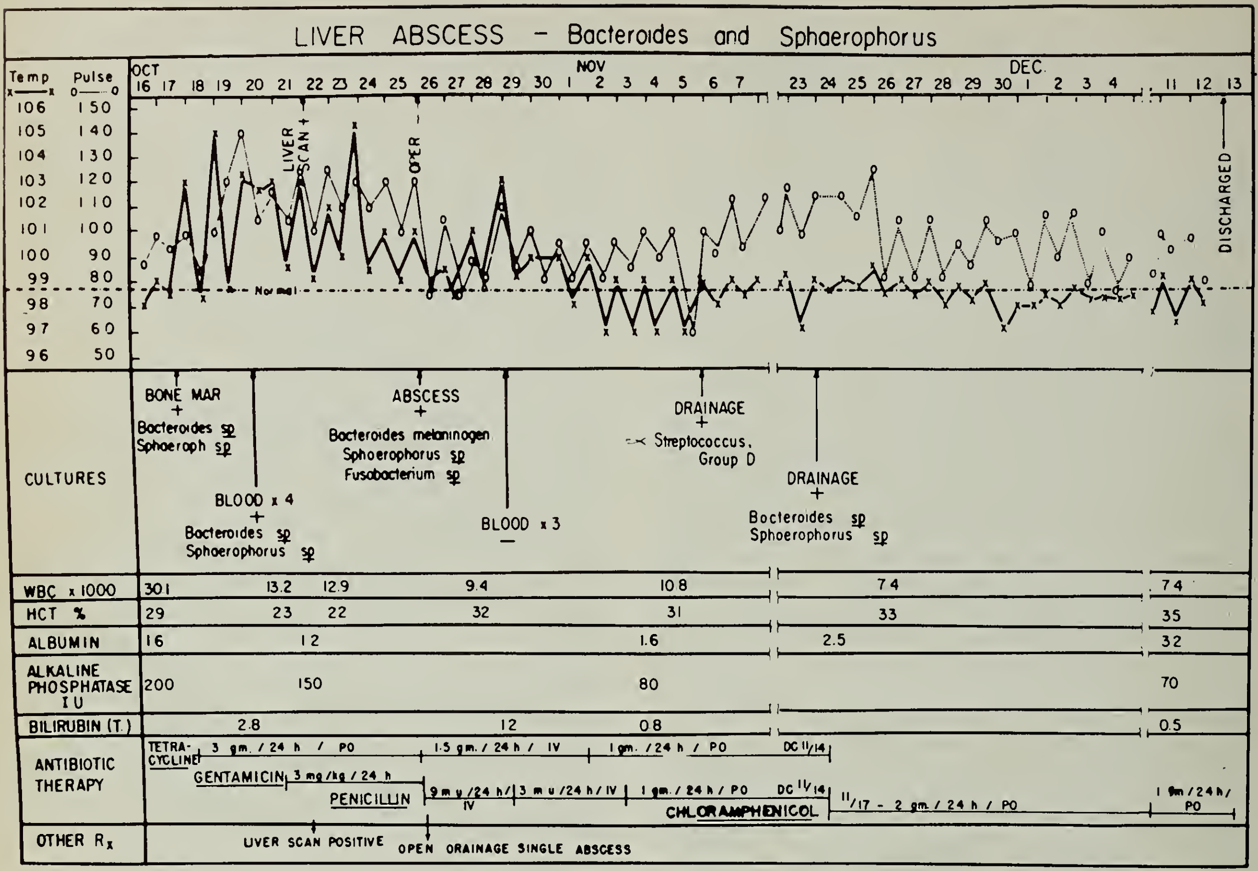

FIGURE I Septic course of 44-year-old male patient with obscure liver abscess and eight-week history. Liver scan revealed large defect in lateral aspect of right lobe. (Reprinted from Archives of Surgery, Vol. 101, page 258, August 1970.)

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the stomach.

Hepatic Radioisotope Scans Liver scans have been of great diagnostic value in demonstrating and localizing hepatic abscesses. In all instances but one, abnormal scans were obtained in those patients in which it was used. The changes were subsequently shown to represent suppurative hepatic disease. (Figure III) In only one patient, proven to have numerous small hepatic abscesses less than 2 cm in diameter, was the scan reported to be negative. The majority of the scans performed in our patients utilized the sulfur colloid, technetium Tc99m, and the Photogamma II or Photogamma III scintillation cameras.

Selective Arteriography Arteriography has also been employed in all of the most recent cases. It has been of value in confirming moderate- and large-sized defects demonstrated by liver scans. Such areas suspected of representing an abscess were proven to be avascular by the selective arteriogram. (Figure IV)

Etiology Specific culture information was available from 21 of the 34 operable pyogenic abscesses. *Escherichia coli* was grown in pure culture from eight (42%) of the 19 cases over the 15-year period. In the past five years, more sophisticated bacteriologic studies have been made, and anaerobic organisms including the anaerobic *Streptococcus, Bacteroides sp., Sphaerophorus sp.,* or *Fusobacterium sp.* were cultured without associated aerobic growth in eight instances. In these cases the cultures would otherwise have been negative or had been previously reported as negative. During the past three years, anaerobes have been isolated exclusively in all cases except for two abscesses in which *E. coli* was grown in pure culture and one case in which *Streptococcus viridans* was cultured in association with the anaerobic *Streptococcus.*

Amoebae were not cultured but were identified on smear from the wound drainage in one instance. In three of the four cases a positive hemagglutination test was obtained to support the diagnosis.

Actinomyces israelli was cultured from each case suspected of being fungal in nature. Biopsies of the hepatic abscess wall also demonstrated the *Actinomyces.*

The larvae with scolices and hooklets of *Echinococcus granulosus* were identified in the case of *echinococcus* disease seen.

Pathogenesis In the Group I patients with pyogenic abscesses of the liver amenable to surgical drainage, direct hepatic involvement by a primary disease served as the portal of entry in 11 cases. Of these, cholangitis was believed to be dominant in eight patients and pylephlebitis in three. Septicemia was the only apparent source of hepatic infection in two other cases, and in ten the sources of infection were not apparent, making the etiology obscure. This latter group was therefore classified as cryptogenic.

In Group II patients, septicemias were noted to be the dominant process in approximately two-thirds of the cases. The sources in four were believed to be cholangitic, in three the liver was involved directly, and in four the mechanisms were uncertain.

TABLE V
CLINICAL SIGNS AND SYMPTOMS
IN PATIENTS WITH LIVER ABSCESSES
AMENABLE TO SURGERY
(Group I — 41 Patients)

Signs and Symptoms	Patients	Percent
Temperature Elevation	39	95
Abdominal Pain	25	61
Anorexia	22	53
Hepatomegaly	21	51
Abdominal Tenderness	21	51
Fever	18	43
Jaundice	12	28
Pulmonary Signs	8	20
Chills	9	22
Vomiting	6	14
Respiratory Symptoms	5	12

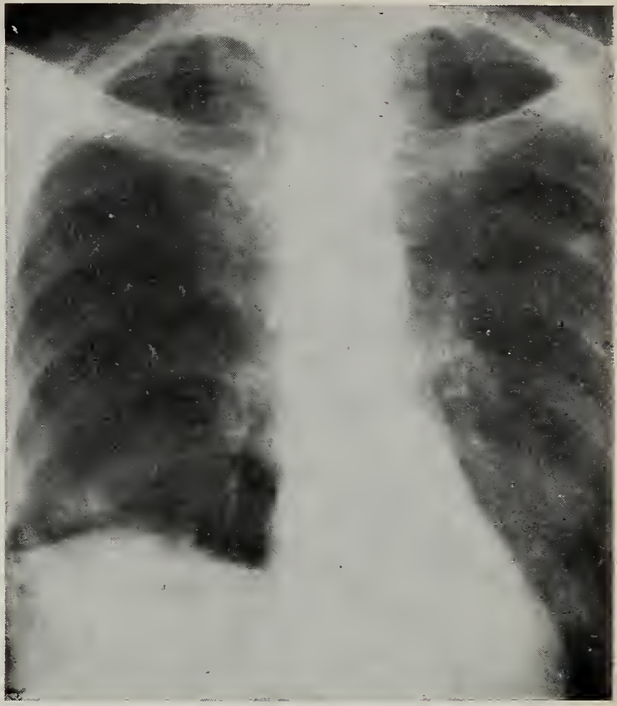

FIGURE 2 Chest roentgenogram showing marked elevation of the right diaphragm and changes above and below diaphragm caused by large liver abscess, which had perforated to produce an extensive subphrenic abscess.

Associated Diseases Various diseases associated with pyogenic liver abscess appeared to be of considerable clinical significance. Disease of the extrahepatic biliary tree was the most frequent associated illness in 13 of the 34 patients with surgically significant hepatic abscesses. An obstructive component due to calculi or malignant disease including carcinoma of the pancreas, gallbladder, or bile ducts was present in nine. Five had abscesses involving the hepatic substance in the area of the gall bladder bed related either to empyema or a pericholecystic abscess.

Seven liver abscesses developed in areas of previously existing intrahepatic disease. Hepatic polycystic disease was encountered with infection in three of these, having developed in the intrahepatic cysts. In three other cases, the abscesses were related to metastatic carcinoma with necrosis and secondary infection.

TABLE VI
DISEASES ASSOCIATED WITH PYOGENIC ABSCESSES AMENABLE TO SURGERY
34 PATIENTS

Biliary Tract Disease		13
Inflammatory Disease	9	
Malignant Disease	4	
Intrahepatic Disease		7
Polycystic Disease of the Liver	3	
Metastatic Carcinoma	3	
Tuberculous Involvement	1	
Extrahepatic Extrabiliary Disease		14
Pneumonia	3	
Peritonitis	1	
Probable Pre-existing Appendicitis	1	
Chronic Pancreatitis	1	
Diverticulitis with Abscess	2	
Subphrenic and Interloop Abscesses	1	
Regional Enteritis	1	
Ulcerative Proctitis		
Acute Hemorrhagic Pancreatitis	1	
Pneumonia-Meningitis-Septicemia	1	
Urinary Tract Infection	1	
Total		34

Two of these primary malignancies were of colon origin and one of the lung. One case appeared to have resulted from the extension of a tuberculous empyema into the dome of the liver. In the 12 cases, extrahepatic extrabiliary diseases were associated with the suppurative hepatic disease.

The prominent disease processes associated with the abscesses not amenable to surgery were often extraperitoneal and related to the suppurative hepatic disease most often by septicemia alone.

Of the eleven children, only three had abscesses amenable to surgical drainage. In one the abscesses were complications of a severe regional enteritis. This rare complication of regional enteritis has been previously described.[15] In the other two children the etiology was obscure. Of the remaining children, three had associated lymphoblastic leukemia, two were premature infants with associated infection, one had extrahepatic biliary atresia, and three others succumbed to a septicemia originating from an extrahepatic source.

Among the other associated diseases was diabetes mellitus found in approximately 15 percent of the patients in the total series, and septicemia occurred in one-third of these. The association of diabetes mellitus and hepatic abscess has been noted previously.[16] The septicemia was believed to be a complication of the hepatic abscess in most of the patients with lesions adaptable to surgical drainage,[17] and septicemia occurred in over half of these patients (56 percent).

Complications The complications which were recognized are listed in Table VII. Seventeen cases in which septicemia was believed to be a complication of the hepatic abscess are included. Four abscesses ruptured into the subphrenic space without further extension, and each of these was pyogenic in nature. Four others extended into the pleural cavity to produce an associated empyema, three of these being amoebic and one pyogenic. Two perforated into the peritoneal cavity with resultant generalized peritonitis. Both of these involved necrotic metastic carcinomas.

The patient with echinococcal disease of the liver leaked from the cysts preoperatively, and at surgery daughter cysts were noted on the surface of the liver and adjacent hepatic flexure.

One amoebic abscess drained itself spontaneously through the diaphragm, lung, and bronchial tree. The patient with regional enteritis developed a recurrent abscess approximately one month following her initial drainage procedure. (Figure V) Another suffered a massive pulmonary embolism and expired in the postoperative period.

Surgical Procedures The surgical approach in all cases but one was transabdominal, the position of the incision depending upon the suspected or demonstrated location of the abscess. In most cases the incision was a right subcostal one. When possible, drainage was performed extraperitoneally. This was frequently impossible, however, because of the lack of adhesion between the liver and the

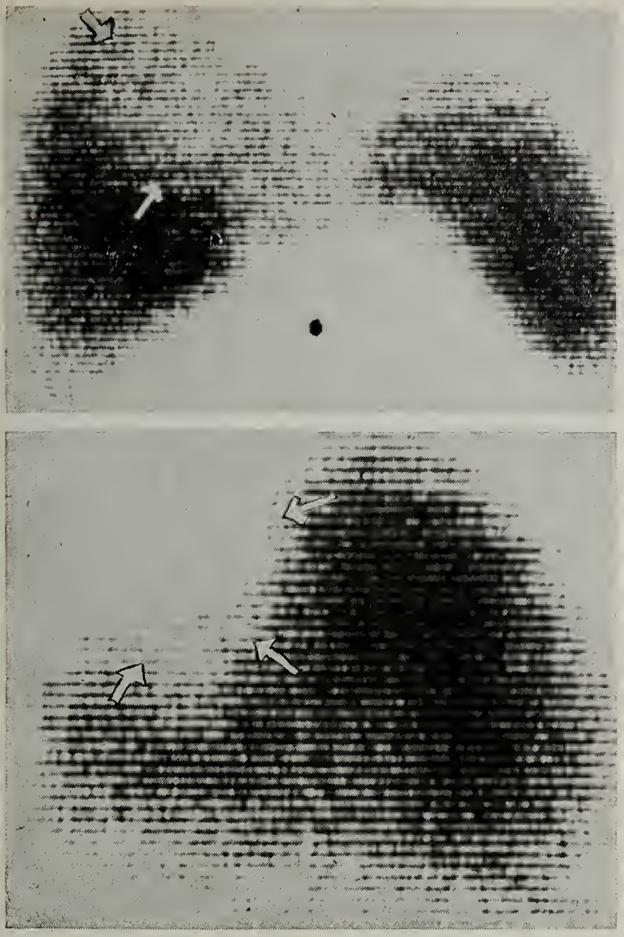

FIGURE 3 Liver scan posterior-anterior (A) and lateral (B) showing presence and location of a large lesion in the superior and posterior aspects of the right lobe as indicated by the arrows.

diaphragm and the urgent nature of the case which did not permit delays or multiple procedures. Under these circumstances, the liver was approached intraperitoneally, the abscess located by palpation and needle aspiration. With the needle in place, drainage was accomplished by cautery incision along the needle position into the abscess cavity which often was located in the liver tissues for a distance of 3 to 5 or more cm. To minimize contamination, the operative area and wound edges were walled off by laparotomy sponges before the abscess was opened, and the purulent contents quickly removed by the aspirating tip attached to suction. A large caliber soft rubber tube or Foley catheter was then inserted into the abscess cavity to minimize continuing intraperitoneal contamination and infection, and it was brought out through a flank stab wound. Soft rubber tissue drains, brought out through a subcostal flank stab wound, were inserted into the subphrenic, intrahepatic, right renal, and right paracolic spaces. The surgical working incision was then closed both in layers and with retention sutures.

Antibiotic Therapy Antibacterial therapy was used in all cases preoperatively, intraopertively, and postoperatively as indicated. When possible the selection of the antibacterial agent or agents was made preoperatively on the basis of cultures and sensitivity tests made usually on microorganisms isolated from the blood stream. When such cultures were not available preoperatively, the selection of the antibiotic agents was made on the basis of a presumptive etiology until specific information was provided by examination of gram-stained preparations of the pus at the time of operation or later by the results of the cultures and sensitivity tests.

The antimicrobial therapy was continued for variable periods depending upon the size of the abscess, the association of septicemia, and other smaller abscesses, and the patient's postoperative course. In most instances the duration of therapy exceeded 14 days, and occasionally was extended for as long as 10 weeks.

The development of secondary postoperative abscesses was not significant, and the preoperative, operative, and postoperative antibiotic therapy was interpreted as having been helpful in this regard also.

Mortality Mortality in these patients with suppurative disease of the liver was strikingly related to accurate diagnosis and effective drainage. (Table VIII) Unrecognized hepatic abscesses were invariably fatal. In contrast, all patients but one whose liver abscesses were drained survived during the 16-year period. It is interesting to note that this patient died of a massive pulmonary embolism in his postoperative period during which he was recovering from his infection.

In the first two periods of the study a positive diagnosis was made prior to death in only 20 percent and 18 percent of the cases respectively. In the last six-year period, however,

Table VII
Complications of Liver Abscesses
(Group I)

Complication		No.
Septicemia		17
Rupture into the Right Subphrenic Space		6
Without Other Complications	4	
Without Associated Empyema	4	
With Empyema and Bronchial Communication	1	
Perforation with Generalized Peritonitis		2
Empyema Without Involvement of Subphrenic Space		2
Recurrence of Abscess		1
Obstruction of Hepatic Duct (Intrahepatic)		2
Leakage of Cysts (Preoperative)		1
Pulmonary Embolism (Postoperative)		1

a positive diagnosis was made in 80 percent of the cases. This increase in the number of abscesses recognized has permitted a marked reduction in mortality from 80 percent and 82 percent in the first two five-year periods, to 20 percent in the last six years. There has been no mortality in the last nine cases seen by the authors.

The diagnosis of liver abscess has been very difficult until the recent introduction of liver scan techniques using radioisotopes. Between 1955 and 1965 a correct antemortem diagnosis was made in only 19 percent of the cases, and all of the remaining 81 percent were diagnosed at autopsy. By marked contrast, a correct diagnosis was made during the past six years in 80 percent of the cases. This difference was attributable directly to the definitive localizing results of the liver scans and the earlier and more effective operations to drain the abscesses. With the mortality of undrained abscesses being 100 percent during this 16 year study, the significance of early and correct diagnosis has become obvious.

Discussion

Hepatic abscess has been a life-threatening clinical entity of infrequent occurrence. It has consisted of three general types: bacterial or pyogenic, parasitic, and mycotic. In our series of 68 cases, the pyogenic type was by far the most frequently encountered, consisting of two general varieties: (1) a solitary or confluent abscess usually limited to one hepatic lobe and amenable to surgical drainage, and (2) multiple small abscesses throughout both lobes and not amenable to surgical drainage. Our study of 68 patients with liver abscesses seen at the University of Cincinnati Medical Center has given us a better understanding of the nature of this disease and improved methods of diagnosis and treatment.

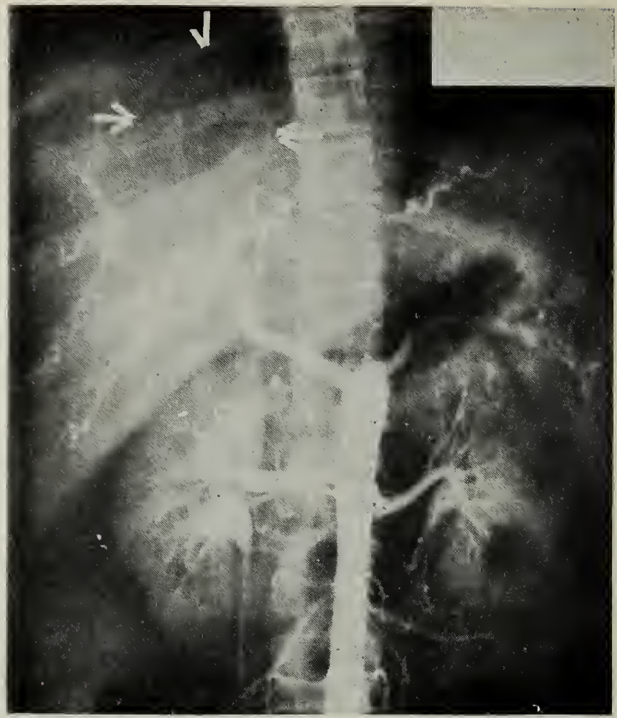

FIGURE 4 Arteriogram including the celiac axis confirming the presence and location of an avascular area in the superior portion of the right lobe of the liver. Convexity of the curved branches of the hepatic artery confirms the presence of the abscess.

The observations of others that liver abscess has been a secondary disease with a primary focus usually being demonstrable[1,9,18,19] have been confirmed by our observations. In approximately one-fourth of our cases, however, the primary source was not detectable, and these were classified as cryptogenic. Similar observations have been made by others.[9,18]

TABLE VIII
LIVER ABSCES:: RELATIONSHIP OF DIAGNOSIS, SURGICAL DRAINAGE, AND MORTALITY
(68 Patients)

Time Period	No. of Cases	Number/% Diagnosed	Number Drained	Mortality in Drained Cases	Mortality No Drainage	Overall Mortality
1955-59	10	2/20%	2	0%	100%	80%
1960-64	11	2/18%	2	0%	100%	82%
1965-70	20	16/80%	16*	6%+	100%	20%

*One abscess decompressed after spontaneous rupture.
*One patient died with a pulmonary embolism in the postoperative period.

The evidence has indicated that the pathways of infection to the liver in our series included direct extension from contiguous disease, the portal vein, the biliary ductal system, the hepatic artery, and the umbilical veins in the newborn infant.

Its incidence as a solitary or confluent lesion has remained relatively constant during the past 16 years. There has been a progressive decrease in the number of cases recognized to have multiple small abscesses of the liver. However, this most likely has been the result of effective antibiotic therapy of the primary non-hepatic disease and its complicating sepsis.

The age incidence has shown two patterns. In the Group I patients with localized abscesses, the age incidence has been distributed relatively evenly throughout all decades of life. In the Group II patients with multiple small abscesses, on the other hand, two peaks of greatest incidence in the extremes of life were noted: the newborn infant and sixth and seventh decades. The similarity of these observations to those observed by us in patients with gram-negative septicemia was of interest.

In the pyogenic abscesses, a variety of aerobic bacteria were cultured from the abscesses in the majority of instances. The aerobic gram negative bacilli identified included *E. coli, Aerobacter aerogenes, Alkaligenes faecalis, E. intermedia,* and in that order of frequency. Other aerobic bacteria found were the *non-hemolytic streptococcus* and *beta hemolytic streptococcus.* During the past three years, eight of 12 abscesses yielded only anaerobic bacteria, these being anaerobic *Streptococcus sp., Bacteroides,* and *Actinomyces.* Similar observations have also been made by St. John et al[20] and Block et al.[21]

The onset of abscess of the liver has been insidious, its presence obscure, and its localization difficult. The signs and symptoms noted in our patients generally coincided with those described by other authors.[1,6,22,23] While many patients had dull pain and tenderness in the right upper quadrant few had signs which were little more than suggestive of liver abscess. Roentgenograms of the chest and abdomen likewise gave suggestive evidence in some cases, but were of little help in the differential diagnosis. Oral and intravenous cholangiograms were essentially useless as indications of this form of hepatic infection.

In contrast, liver scanning procedures used during the past six years were of great value in indicating preoperatively the presence of hepatic abscesses and their localization. On the basis of this experience, it has been concluded that radio-isotopic scans should be considered in all patients with obscure signs of sepsis.

Selective arteriograms of the celiac axis and hepatic artery have been of more limited value. Their usefulness has been in demonstrating larger avascular areas and confirming defects noted on the liver scans.

The laboratory data of particular diagnostic importance were leucocytosis with a shift to the left, mild anemia, increased alkaline phosphatase levels, decreased serum albumin levels, and increased bromsulphalein retention.

Summary

The experience in a series of 68 patients with liver abscesses seen at the University of Cincinnati Medical Center has been studied to obtain a better understanding of the incidence, etiology, pathogenesis, diagnostic problems, effectiveness of therapy, morbidity, and mortality of this serious disease.

This study has emphasized the fact that the mortality of this life-threatening disease was 100 percent when undiagnosed and undrained surgically. In contrast, there was no mortality in all of the cases but one in which a diagnosis had been made and surgical drainage was instituted.

During the past six years, our capability of diagnosing and localizing abscesses 2 cm or larger has been greatly increased by the use of radio-isotopic liver scanning techniques, aided more recently by hepatic arteriography. The benefits of these new techniques have been obvious in a disease in which the mortality otherwise has been 100 percent when surgical drainage has not been instituted. The more definitive and earlier diagnosis of liver abscesses has permitted life saving surgical drainage with no mortality under the planned and safer conditions thus made possible. In addition, the number of correctly diagnosed cases which could be operated upon successfully was increased.

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This (the healthy appearance of convalescents from typhus at Meath Hospital, Dublin) is all the effect of our good feeding; and lest, when I am gone, you may be at a loss for an epitaph for me, let me give you one, in three words: — He Fed Fevers.

Robert James Graves (1796-1853). Quoted in *A Memorial of Graves,* "The Life and Labours of Graves"

INCREASING INCIDENCE OF FUNGAL INFECTIONS

• Nosocomial factors predispose hospital patients to infections with fungi which under normal conditions do not usually cause infection in man. The clinician and the clinical laboratory must be alert to the possible occurrences of these infections.

Eileen L. Randall, Ph.D.

An ever increasing number of fungal infections are being reported, especially those due to opportunistic fungi[1,3]. The reasons for this increased incidence are probably multiple, and some of these are listed in Table 1.

The use of broad-spectrum antibiotics which affect normal flora, especially that of the gastrointestinal tract, is felt to play an important role in the emergence of many fungi, particularly yeast[4,5]

The administration of antimetabolites to patients with malignancies constitutes another important predisposing condition which enables fungi to invade tissue. The deleterious effect of these agents on the mucous membranes of the body, including those of the intestinal tract, provides a ready portal of entry for fungi that are normally found in the gut, such as *Candida albicans*, other *Candida* species, *Torulopsis*, *Trichosporon*, and *Rhodotorula*. The drug-induced granulocytopenia is an important factor in the decreased defense to all types of infections, including those due to fungi.

Corticosteroids have been incriminated as a predisposing factor in the occurrence of fungal infections, especially those due to *Aspergillus*.[5] These agents are known to produce a defective function of the polymorphonuclear leukocyte.

The increased use of immunosuppressive agents, through their effect on the humoral and cellular immunity, constitutes another well known predisposing factor in the occurrence of fungal infections, particularly those caused by *Candida* and *Aspergillus*. As the number of patients undergoing various transplantations increase, we can be certain that there will be observed a concomitant increase in the number of fungal infections.

Urinary bladder instrumentation and the prolonged use of urinary catheters, especially in the female, promote the growth of fungi such as yeast.

The increasingly common use of central venous pressure catheters and indwelling venous catheters for the administration of various fluids constitutes another very important factor in the rising incidence of fungemia.[6]

Patients with tracheostomies commonly become infected with bacteria, and this site can be an important portal of entry into the body of fungi such as yeast.

Certain disease states are associated with a variety of fungal infections and are listed in Table 2. *Mucor* and *Candida* occur in patients with diabetes mellitus. *Aspergillus* fungus balls, aspergillomas, are being seen with increasing frequency in patients with sarcoidosis, particularly those patients with cavitary disease who are receiving steroids. Aspergillomas are being observed also in patients with cavitary disease due to tuberculosis and malignancy. An increased incidence of nocardiosis is seen in patients with alveolar proteino-

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Table 1

Some Causes for the Increased Incidence of Fungal Infections

1. Use of Broad-Spectrum Antibiotics
2. Administration of Antimetabolites
3. Administration of Corticosteroids
4. Administration of Immunosuppressive Agents
5. Use of Indwelling Intravenous Catheters
6. Use of Urinary Tract Catheters
7. Tracheostomy

sis. It is a well established fact that patients with Hodgkin's disease, leukemia, and other blood dyscrasias are more prone to fungal infections caused by *Cryptococcus*, *Candida*, and *Aspergillus*. The burned patient is quite susceptible to fungal infections, and *Mucor* and *Candida* are often incriminated. Lastly, patients who have undergone surgical procedures appear to be more prone to fungal infections.[5] The occurrence of *Candida* endocarditis in patients whose heart valves have been replaced is not uncommon, and the finding of *Aspergillus* in the heart muscle of patients who have undergone heart transplantation has been reported.

At Thomas Jefferson University Hospital during the past several years we have seen an actual increase in the number of patients with fungal infections. A greater number of specimens are being sent to the laboratory requesting fungal cultures than were sent even two years ago, and a greater number of fungal isolates are being made.

In Table 3 can be seen the numbers of "mold" isolations that have been made during two separate two-year periods, 1967-1968 and 1969-1970. The most common mold isolated is *Aspergillus*, and this is often a laboratory contaminant. It is often difficult for the laboratory to attach clinical significance to the mere isolation of *Aspergillus* from clinical specimens because of the ubiquitous nature of this organism. The diagnosis of aspergillosis, therefore, is usually made on clinical evidence plus the repeated isolation of the organism from the patient. The number of isolations of *Aspergillus* during the last two-year period have decreased from 529-470 — a reflection of less contamination in the laboratory. *Penicillium* is the next most common mold isolation and has been considered contamination with the exception of one case where *Penicillium* was isolated from a lung abscess of a patient from whom *Coccidioides* was also isolated. It was felt that the *Penicillium* was a secondary invader. Relatively few isolations of other molds are made. Mold isolations over this four-year period represent 27 per cent of the total fungal isolates.

Table 4 shows the number of "yeast" isolations that have been made during these same two-year periods. The single most common isolate is *Candida albicans*, and the number of isolates doubled during the last two-year period, going from 761 to 1534. The number of *Candida* species not *C. albicans* went from 311 to 619 and the isolation of *Geotrichum* from 30 to 120. The numbers of *Torulopsis* and *Trichosporon* isolates also showed increases during this period. It can be seen from comparing Tables 3 and 4 that yeast isolates are most commonly made, and they represent 73 per cent of the total fungal isolates.

Yeast are not only the most commonly isolated fungi, but they also constitute the majority of the clinically significant isolates. In Table 5 can be seen the numbers of patients from whom yeast have been isolated from blood. The number of patients are divided into three separate five-year periods. Again *Candida albicans* has been the most common species, and there has been a sharp increase in the number of infected patients during the

Table 2

Disease States Which are Associated With Fungal Infections

1. Diabetes Mellitus
2. Sarcoid
3. Tuberculosis
4. Malignancy
5. Alveolar Proteinosis
6. Hodgkin's, Leukemia, and Other Blood Dyscrasias
7. Burned Patients
8. Patients with Surgical Procedures

	1967 - 1968	1969 - 1970	TOTAL
Aspergillus	529	470	999
Penicillium	52	53	105
Unidentified Mold	26	8	34
Cladosporium	13	11	24
Paecilomyces	6	14	20
Rhizopus	4	15	19
Other Molds	47	66	113
Total	677	637	1314

Molds — 27% of Total Fungal Isolates

Table 3

Mold Isolations

Thomas Jefferson
University Hospital

last five-year period rising from 7 in 1961-1965 to 41 during the 1966-1970 period. *Candida* species not *albicans* is the next most commonly isolated, and it too has shown a sharp increase during the last five-year period going from 1 to 3 to 30. Unidentified yeast are those that were discarded or died before proper identification was made. The number of patients from whom *Cryptococcus* has been isolated have not increased during these periods. Three patients with *Torulopsis* and one patient with *Geotrichum* have been seen during the last five-year period. During 1970 twenty-one patients had fungemia due to various species of yeast, and a common isolate was *Candida parapsilosis.* Many of these patients had indwelling venous catheters.

Yeast are most commonly recovered from blood cultures when pour plates of the patient's blood are made. Many strains of *Candida* will not grow in commercially available broth bottles, presumably because of fungistatic or fungicidal substances normally present in blood. Colonies of yeast in pour plates can be detected as early as eighteen hours after the blood culture is taken.

Table 6 shows the numbers of patients with systemic fungal infections seen during the last fifteen years. These represent all types of infections, including pneumonic processes, aspergillomas, fungemias, central nervous system disease, and other systemic organ involvement. Again they are divided into three five-year periods, and a definite increase in the total numbers is seen during the last five-year period: 57 from 1956-1960, 56 from 1961-1965 and 155 from 1966-1970. *Candida* species was the etiologic agent in 122 patients (46 per cent) and *Aspergillus* in 71 patients (25 per cent). The 27 patients with unidentified mold were patients in whom a diagnosis of fungal infection was made at the time of post mortem, and the organism was not identified as to genus. Most of these were probably due to *Candida* or *Aspergillus.*

Infections due to cryptococci have remained at almost the same level throughout the 15-year period.

The numbers of patients infected with *Nocardia* and *Actinomyces* do not represent the total number of patients with infections due to these organisms. This table represents those that were found to be cultured positive in the mycology division, and most of these infections are diagnosed in the bacteriology division.

The patients with *Torulopsis, Mucor, Coccidioides, Histoplasma,* and *Geotrichum* were so few in number that evaluations as to their increasing appearance cannot be made.

Laboratory diagnosis of systemic fungal infections is at times difficult. The mere isolation of certain fungi such as yeast and *Aspergillus* is not proof of infection as these organisms, especially yeast, are many times part of the normal flora of the body. *Aspergillus* is a common airborne contaminant of our environment, and isolation of it from culture media commonly occurs.

When *Candida* has invaded tissue, the organism appears in its hyphal form. Thus, if smears are made from urine, areas of thrush,

Table 4

Yeast Isolations

Thomas Jefferson
University Hospital

	1967 - 1968	1969 - 1970	TOTAL
Candida Albicans	761	1534	2295
Candida Species	311	619	930
Geotrichum	30	120	150
Torulopsis	42	62	104
Trichosporon	22	44	66
Other Yeast	27	26	53
Total	1193	2405	3598

Yeast — 73% of Total Fungal Isolates

or feces, and yeast forms with pseudohyphae are seen, tissue invasion should be suspected. The interpretation of a patient's sputa showing yeast forms with pseudohyphae is more difficult as the lung might not be involved, but the yeast may be present in another portion of the respiratory tree. Sputa obtained by transtracheal aspiration would be more easily evaluated.

Torulopsis is beginning to be reported as a cause of opportunistic infections. It has been increasingly seen at our hospital especially from the urinary tract and has been isolated from blood cultures of three patients. This organism should be suspected from patients when small yeast about half the size of *Candida* that do not form hyphae are observed on gram-stained smears or wet mounts. At times *Torulopsis* does not grow well on blood agar and only pinpoint colonies will be observed. It grows well on Sabourauds's dextrose agar.

Geotrichum is suspected when rectangular yeast cells are seen in gram-stained smears. It should be differentiated from a closely related genus, *Trichosporon*, which culturally mimics *Geotrichum*. Both of these organisms are part of normal bowel flora and are being observed as causes of fungal infections.

India ink stains of spinal fluid or other body fluids enable the capsule of *Cryptococcus* to be observed. Periodic acid shift stains, such as Gridley's, stain the polysaccharide capsule well in tissue slides containing cryptococci. When Cryptococcosis is suspected and the organism is not observed in spinal fluid, large amounts of urine, including that obtained at the very end of urination, should be centrifuged and cultured. *Cryptococcus neoformans* is being isolated from sputa from patients without evidence of clinical disease. Perhaps this organism can be found as part of normal flora.

Histoplasma, best observed in Wright or Giemsa stained preparation of clinical specimens, is being observed in patients with Hodgkin's disease or other blood dyscrasias. The organism at times is difficult to isolate in culture from sputa, especially if *Pseudomonas* is also present. In tissue sections when few organisms are present, they can be detected easily with a silver methenamine stain. The very small size, two to four micra, of these organisms makes identification fairly easy.

Actinomycosis does not appear to be increasing in frequency. *Actinomyces* is an endogenous organism, and the disease usually occurs after trauma to the mouth area or following abdominal surgery. The organism must be differentiated from *Nocardia* in original smears as both are branching gram-positive rods. *Nocardia* is usually acid fast, especially when stained in smears of specimens containing protein material. In tissue *Actinomyces* grows in colonies referred to as sulfur granules, and *Nocardia* does not. Both elicit a polymorphonuclear response in tissue. *Actinomyces* in tissue must be differentiated from organisms causing botryomycosis, a bacterial disease. In certain patients staphylococci, *Pseudomonas*, and other organisms will grow as granules and, in H and E tissue sections, these are indistinguishable from those produced by *Actinomyces*. A gram-stained preparation of the section will provide the diagnosis.

	1956 - 1960	1961 - 1965	1966 - 1970	TOTAL
Candida Albicans	0	7	41	48
Candida Species	1	3	30	34
Unidentified Yeast	2	3	6	11
Cryptococcus	3	0	1	4
Torulopsis	0	0	3	3
Geotrichum	0	0	1	1
Total	6	13	82	101

TABLE 5

YEAST - BLOOD CULTURES

Thomas Jefferson
University Hospital

Nocardiosis does appear to be increasing in frequency. It is not uncommon in patients with carcinomatosis of the lung. We have observed one patient undergoing hemodialysis whose A-V shunt area became infected with *Nocardia.*

Zygomycosis or phycomycosis caused by *Mucor* and *Rhizopus* species has not been observed often by us. However, during the last several months three patients at post mortem were shown to have systemic disease due to these organisms. On tissue section zygomycosis can be differentiated easily from aspergillosis. *Mucor* and related organisms are nonseptate, have a wider diameter than *Aspergillus,* and branch at right angles. They appear ribbon-like in tissue. *Aspergillus* has septate hyphae and branch at more acute angles.

Aspergillosis is commonly diagnosed at our medical center, and an increasing number of patients are becoming infected each year. Many of these present as aspergillomas superimposed on cavitary disease due to sarcoid, tuberculosis, or malignancy. Some of these spread to invade the parenchyma of the lung, and some remain localized in the cavity as fungus balls. Other patients, especially those receiving antimetabolites or steroids, or both, are not diagnosed until post mortem examination. Systemic spread of the organism in these patients is at times observed, but usually the lesions are confined to the parenchyma of the lung.

In Table 7, thirty patients in whom a diagnosis of aspergillosis has been made are listed with their underlying disease and whether or not the radiology and precipitin test were positive. All of the patients except two showed

	1956 - 1960	1961 - 1965	1966 - 1970	TOTAL
Candida	22	23	77	122
Aspergillus	13	8	50	71
Unidentified Mold	15	12	0	27
Cryptococcus	4	5	5	14
Unidentified Yeast	1	4	4	9
Nocardia	2	1	6	9
Actinomyces	0	2	5	7
Torulopsis	0	0	3	3
Mucor	0	1	1	2
Coccidioides	0	0	2	2
Histoplasma	0	0	1	1
Geotrichum	0	0	1	1
Total	57	56	155	268

TABLE 6

SYSTEMIC FUNGAL INFECTIONS

Thomas Jefferson
University Hospital

Underlying Disease		Radiology		Serology	
Sarcoidosis	19	Positive	18	Positive Not Done Negative	12 5 2
Post Cyst	3	Positive	3	Positive Not Done	2 1
Tuberculosis	6	Postitive	6	Positive	6
Alveolar Proteinosis	1	Positive	1	Positive	1
Allergic Aspergillosis	1	Negative	1	Positive	1

TABLE 7

ASPERGILLOSIS

Thomas Jefferson University Hospital

roentgenologic evidence of disease. Of these two, one had sarcoidosis and one allergic aspergillosis. All of the patients tested except two with sarcoidosis showed a positive precipitin test against antigens prepared from various strains of *Aspergillus.*

The diagnosis of aspergilloma is confirmed by roentgenologic evidence, recovery of the organisms from culture, and serologic studies. When these aspergillomas are surgically removed, wet mount of the contents will reveal either masses of septate hyphae or, in some cases, conidiophores and spores. The finding of spores must depend upon how well the cavities are aerated. Some patients with aspergillomas will cough up portions of the ball, and microscopic examination will slow the organism.

Sputa from some patients with *Aspergillus* present in the parenchyma of the lungs and from many of those with aspergillomas will show branching septate hyphae on wet mount along with numerous polymorphonuclear white cells. Gram-stained preparations are practically worthless as aspergilli do not stain well with this stain, and only a very small amount of sputum is examined.

Summary

A marked increase in the number of patients with fungal infections has been observed over the last five-year period compared to the previous ten years. The two most common organisms isolated from the infected patients are *Candida* and *Aspergillus* species. Two disease processes most commonly seen during the last two-year period are aspergillomas superimposed on sarcoidosis and tuberculosis and fungemia due to *Candida* species. It is postulated that even more fungal infections will be observed in the future because those patients more susceptible to these opportunistic organisms are commonly seen in our medical centers today.

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* * *

> They wondered if wheezles could turn into measles, if sneezles would turn into mumps. . . . All sorts and conditions of famous physicians came hurrying round at a run.
>
> A. A. Milne (1882-1956) *Now We Are Six,* "Sneezles"

FEVER OF UNKNOWN ETIOLOGY

• **A persistent methodical approach to the history and physical examination in the patient with fever of undetermined origin will frequently lead to the reward of uncovering the proper diagnosis.**

Donald B. Louria, M.D.

The first crude clinical thermometer was developed by Sanctorius in the early 1600's. Almost 100 years later, Gabriel Fahrenheit provided the medical profession with the instrument needed to follow accurately the temperature patterns in various disease states. Since that time, a great many astute clinicians have made shrewd diagnoses based, in large part, on the fever curves in the front of every patient's hospital chart. Perhaps no diagnostic challenge fascinates the diagnostician as much as the fever of unknown origin (FUO). Alt and Barker[1] of the Peter Bent Brigham Hospital collected 101 such cases in 1930, and Hamman and Wainright[2] summarized 90 cases with high fever in 1936. In the former series, 57 were febrile for over ten days; a final diagnosis was made in 23 of these cases, the most frequently diagnosed diseases being rheumatic fever (6), tuberculosis (6), and carcinoma (3). In the Hamman and Wainright series, 44 cases were solved, the most frequent diagnoses being syphilis (10), tuberculosis (9), hypernephroma (5), Hodgkin's disease (4), brucellosis (4), hidden abscesses (3), and carcinoma (2).

Chester Keefer, a masterful clinician, collected 80 solved cases in a delightful, brief monograph published in 1955 and entitled "Prolonged and Perplexing Fever."[3] Of the 80 cases, the fever in 51 instances was due to specific infectious agents, including eight due to the tubercle bacillus, six due to species of brucella, and two caused by salmonella species. Additionally, there were four cases of bacterial endocarditis, ten tumors, and four cases of lymphoma. In three instances the fever was due to hepatic cirrhosis, and in two other cases the final diagnosis was thyrotoxicosis.

In the last 30 years, we have added little clinically to the FUO entity. Indeed, I recently referred to my 1952 medical school lecture on FUO delivered by Dr. Louis Weinstein, Professor of Medicine at Boston's Tufts Medical School, and, by general agreement, the most adroit American physician in correctly diagnosing fevers of undetermined origin. With a few small additions, that lecture would be as applicable now as it was about 20 years ago.

Petersdorf and Beeson emphasize this point in a comprehensive article in 1961, and the former in a brief review in 1969.[4,5] They noted that of those with unexplained fever, 40 per cent will have a specific infection, 20 per cent will be found to suffer from tumors, and 20 per cent from collagen vascular disease. In another 10 per cent, the diagnoses will include pulmonary emboli, drug fever, sarcoid and malingering.

Summarized in Table 1 are some of the more frequent and some of the less frequent causes of FUO.

In the last decade, our knowledge about the FUO has been enhanced by the following observations:

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Table 1

Thirty Causes of Fever of Undetermined Origin

FREQUENT	LESS FREQUENT	INFREQUENT
Tuberculosis	Hypernephroma	Regional enteritis
Polyarteritis	Other tumors	Ulcerative colitis
Lymphoma	Endocarditis	Sarcoid
Drugs	Malingering	Thyrotoxicosis
	Hidden abscess	Cirrhosis or fatty liver
	Pylephlebitis	Periodic fever
	Osteomyelitis	Adrenal tumor
	Pyelonephritis	Thyroiditis
	Diverticulitis	Congestive failure
	Salmonellosis	Hyperlipemia
	Malaria	Hypothalamic lesions
	Pulmonary emboli	Brucellosis
	Cytomegalic inclusion virus	
	Cholangitis	

(1) Cytomegalic inclusion disease virus (CMV) may induce a prolonged fever in an otherwise healthy individual. In a recently published series from Denmark, CMV infection was the presumed diagnosis in six of 34 cases of FUO.[6] A substantial peripheral blood lymphocytosis or monocytosis may be noted, and this in itself should suggest the diagnosis. The severity of illness is extraordinarily variable; the patient may appear toxic or virtually asymptomatic. The duration of fever is also unpredictable, ranging from a few days to several months.

(2) Toxoplasmosis may present as persistent fever. Usually cervical or supraclavicular adenopathy is present, but this is not invariably so; and there may be substantial peripheral lymphocytosis. A toxoplasma dye test and determination of complement fixing antibody titers should be of great help in establishing the diagnosis.

(3) Although sarcoid may be manifested as an FUO, this is quite infrequent; more often fever is not a significant part of the clinical picture of sarcoidosis.

(4) Patients suffering from underlying reticuloendothelial system malignancy, especially those being treated with immunosuppressive agents and/or adrenal corticosteroids, are inordinately susceptible to superinfection due to *Pneumocystis carinii*, CMV, *Candida sp.*, *Aspergillus sp.*, or gram-negative enteric bacteria. Such infections may present as an FUO. These organisms also cause clinical disease in patients who have undergone kidney or heart transplantations and are being treated with immunosuppressive drugs.[7-8]

(5) Personnel returning from duty in Southeast Asia may have fever due to dengue, the virus of chickungunya fever, scrub typhus, leptospirosis, or mellioidosis.[9] Furthermore, the patient may have left the endemic area some time ago; in the case of scrub typhus, eg, the incubation period may be as long as 21 days.

(6) Malaria must be considered in virtually every case of unexplained fever in young persons or travelers. An epidemic, initiated by a returning Vietnam veteran, has recently been documented in California among young persons taking heroin intravenously.[10] Even if one takes prophylactic anti-malaria drugs conscientiously while in the endemic area, malaria can become apparent after leaving the endemic area, but more often, the prophylactic regimen has not been followed. Although the incubation period for *P. falciparum*, *P.*

ovale, and *P. malariae* is less than one month, there may be a hiatus of several months between infection and clinical signs in *P. vivax* infections.[11] Consequently, the patient may be far removed from the area in which infection took place. *P. falciparum* infections can relapse up to 18 months later, *P. vivax* and *P. ovale* up to three years later, and *P. malariae* for five to fifty years after initiation of infection.[11]

(7) In children, unusual cases for FUO are familial dysautonomia, viralizing adrenal hyperplasia, hyperthyroidism, and infantile cortical hyperostosis.[12]

(8) Certain signs should suggest specific diagnoses:

(a) fundal infiltrates — tuberculosis or collagen disease. Careful fundoscopic examination should be performed every few days on every patient with an FUO, dilating the pupils, if necessary.

(b) red, weeping eyes — polyarteritis.[13]

(c) conjunctivitis — lupus erythematosus, tuberculosis.

(d) trapezius soreness — subdiaphragmatic abscess.[13]

(e) sternal tenderness — marrow invasion.[13]

(f) muscle tenderness — polyarteritis.

(g) back pain — staphylococcal or salmonella osteomyelitis or enterococcal aortic valve endocarditis.

(9) In the adult, hyperlipemia, temporal arteritis, atrial myxoma, and thyroiditis have all been emphasized as infrequent causes of FUO.

(10) The erythrocyte sedimentation rate should be determined in every case; if it is normal, the prognosis is good, whether or not a specific diagnosis is established.[14] A normal sedimentation rate should also spur further consideration of the possibility the patient is malingering.

The following cases illustrate some of the pitfalls in arriving at a correct diagnosis.

Case 1

A 26-year-old man suffered from disabling arthritis, leaving him unable to turn himself. The administration of adrenal glucocorticoids resulted in mild improvement, but after two months of therapy, he developed unexplained fever. After ten days of fever, a consultation was obtained. Examination revealed little, and questioning of the nurses indicated he had no decubiti. A diagnosis of steroid-induced arteritis was considered seriously, but that day somebody turned the patient over, saw a subcutaneous bulge and drained over 500 ml of frank pus.

Comment: This case illustrates the consequences of not doing the physical examination oneself. Here, the patient could not turn himself, and the physician was contented with the assurance that there were no focal lesions on or under the skin in the buttock area. This obviously makes no sense. If the staff had noted a buttock lesion, they would have attended to it, and there would have been no need for the advice of a consultant. Failure to examine the skin or the teeth (for an apical abscess) will result occasionally in an embarrassing mis-diagnosis.

Case 2

A 24-year-old man was hospitalized because of shaking chills and fever of two weeks' duration. The history contributed little else. Physical examination was negative. Laboratory studies showed a mild elevation of the alkaline phosphatase, and on liver biopsy some polymorphonuclear leukocyte infiltration was evident. Although it then appeared clear that there was hepatic infection, the exact nature of the disease process was unclear. Cultures of blood and liver biopsy showed no growth. At laparotomy, a retrocecal appendix that had ruptured was found. Another history was obtained, focusing on the known diagnosis of appendicitis with rupture and pylephlebitis. The patient then gave a perfectly clear and classic story of mid-abdominal pain that moved to the right lower quadrant. This lasted for eight hours, disappearing after his physician, contacted by 'phone, ordered a cathartic. One week later, the fever and chills started.

Comment: The physicians all concentrated on the nature of the illness from the time the fever began. Vague questions were asked about previous illnesses, but no one thought to ask specifically about appendiceal-type pain in the recent past, and the patient did not volunteer the information. There is just no substitute for taking another detailed and thoughtful history when faced with an FUO. Each of the major diagnostic possibilities listed in Table 1 should be considered, and the history sequentially focused on each possibility.

Case 3

A 42-year-old woman was hospitalized because of fever to 103-104 F each night. History and physical examination were totally unrewarding, and blood cultures were negative. Liver function tests were also normal. Skin tests showed a negative first-strength tuberculin, a moderately positive intermediate strength and a strongly positive second strength PPD. After three weeks of bed rest, she appeared much improved, and the temperature now did not rise above 101 F by rectum. At that time, a liver biopsy was taken and showed caseating granulomas in which typical tubercle bacilli were seen.

Comment: We tend to forget that in disseminated tuberculosis the patient may become virtually afebrile merely on bed rest, and that liver involvement, as in this case, may be prominent even though all liver function tests are normal. In any patient with an unexplained fever and a positive tuberculin test, this diagnosis should be considered foremost.

Case 4

A 79-year-old woman was hospitalized because of weakness, fever, and muscle aches of three weeks' duration. Physical examination on admission showed no abnormalities. Laboratory studies revealed negative blood, urine, and stool cultures. The alkaline phosphatase was minimally elevated. Febrile agglutinins were negative, as was the tuberculin skin test. White blood cell count was normal, and there was no anemia. Her fever persisted, the daily peak almost always being recorded in the morning. At the end of three weeks of hospitalization, consultation was requested. Physical examination was unchanged except for moderate muscle atrophy unaccompanied by tenderness. A diagnosis of biliary tract obstruction and ascending cholangitis secondary to tumor or stones was made, with an alternative diagnosis of tumor involving the liver. Subsequent cervical node and muscle biopsies showed necrotizing vasculitis (polyarteritis).

Comment: In this case, the diagnosis should have been made immediately on the basis of the temperature pattern. Persistent fever with a morning spike is usually due to tuberculosis, polyarteritis or salmonellosis. The tuberculin skin test was negative, and cultures as well as serological tests did not support a diagnosis of salmonellosis. This left only polyarteritis. I actually made that diagnosis on looking at the temperature chart before seeing the patient, but made two mistakes that led to an incorrect shift in diagnosis. First, I ascribed the moderate muscle atrophy to lying in bed and gave too little emphasis to the initial aches, because at the time of examination, I found no muscle tenderness. Second, I talked myself out of the diagnosis of polyarteritis because of the alkaline phosphatase elevation; but it is well known that polyarteritis can cause marked abnormalities in liver function.[15] Similar attention to the temperature pattern may also be helpful in leishmaniasis and gonococcal endocarditis, which often cause a double temperature spike each day, once in the morning and once in the evening.

Case 5

A 36-year-old woman was hospitalized because of nocturnal fever to 103 F for a period of four weeks. Physical examination was entirely normal. Laboratory studies, erythrocyte sedimentation rate included, were normal except for a mild peripheral eosinophilia of 9 per cent. Cholecystogram, intravenous pyelogram, and long bone x-rays were negative. The fever persisted, and because of a questionable abdominal mass, an exploratory laparotomy was performed. No definite pathology was found, but several vessels were biopsied because the surgeon observed that the vessels felt firm on palpation. All biopsies showed normal tissue. The diagnostic enigma was solved when the patient's husband informed the staff that he thought his wife was heating the thermometer. Careful observations thereafter confirmed that this was so. The mild eosinophilia persisted without explanation.

Comment: The patient underwent many expensive tests and abdominal surgery unnecessarily. The diagnosis should have been suspected when the erythrocyte sedimentation rate was found to be normal. Even feeling the skin when the thermometer read 103 F would have obviated the prolonged hospitalization. The staff was fooled because they attributed too much significance to the eosinophilia, and because they accepted the fever as valid on the grounds that the elevation occurred only during the evening. However, today many sophisticated persons are fully aware of the normal diurnal temperature variation-pattern, and even with a curve that appears due to organic disease, it is still necessary to make sure that the fever is not factitious.

Case 6

A 42-year-old man was hospitalized with a six-month history of intermittent fever of up to 103 F by rectum. He had traveled extensively, and despite an entirely negative physical examination, an amebic liver abscess was suspected. None was found, and an extensive laboratory examination showed only an elevated erythrocyte sedimentation rate and an increased serum alpha$_2$ globulin. For three weeks he remained febrile and undiagnosed. Then the fourth house officer dealing with the case decided to take a completely new history, going through the diagnostic possibilities one by one. When he reached the category of thyroid abnormalities, he asked specifically about transient discomfort on swallowing. The patient remembered a ten-day period at the beginning of his illness, but the discomfort was so mild he had forgotten all about it. Physical examination showed minimal, if any, throat tenderness, but serum PBI, iodine uptake studies and thyroid biopsy all confirmed the diagnosis of subacute thyroiditis.

Comment: This case shows the value of a careful history, taken repeatedly if necessary, focusing on specific diagnostic possibilities.

Case 7*

A 31-year-old man suffered from Gaucher's disease for which he had undergone splenectomy. Because of bone marrow hypoplasia and profound anemia, he was repeatedly given blood transfusions. Several weeks after one set of transfusions, he developed shaking chills and fever to 105 F by rectum. An extensive work-up at two hospitals, including stool, blood, and urine cultures, did not provide a diagnosis. The only change in his laboratory examination was an increase in the lymphocyte percentage in his peripheral blood smear from 40 to 63. Over a six-week period, the fever lessened, but he was still febrile to about 102 F on most days, usually in the evening. Because of a positive intermediate strength tuberculin test, he was treated for presumably active tuberculosis, despite a negative chest x-ray. When the fever persisted, treatment for culture negative bacterial endocarditis was instituted; this was justified on the basis of fever and a systolic heart murmur, although it was recognized the murmur could well be due to the substantial anemia. Only after six weeks of fever was proper attention paid to the increased peripheral lymphocyte count. Although urine cultures did not show cytomegalic inclusion virus, complement fixation studies showed a diagnostic increase in antibody against the virus.

Comment: Shaking chills do not exclude the diagnosis of tuberculosis, but they do militate against it. There is a natural inclination to make a presumptive diagnosis of endocarditis in the presence of fever and a murmur, even if blood cultures are negative. But ordinarily, this impulse should be resisted unless there is clear evidence of underlying valvular heart disease or a convincing clinical picture indicating bacterial endocarditis: ie, clubbing, petechiae, emboli to the eye or extremities, Osler's nodes, etc. If the patient has an FUO, the likelihood of endocarditis being present in the absence of positive cultures is directly related to how closely the clinical picture resembles classic bacterial endocarditis. If the diagnosis is based solely on the presence of a murmur of questionable significance, it is likely the diagnosis is incorrect. In all such patients, blood cultures should be obtained in hypertonic media since these may occasionally be positive when routine cultures are negative. It is well to remember that cytomegalic inclusion virus infection can occur in healthy or compromised hosts, may persist for many weeks, and may be associated with either severe or mild clinical illness; and, of course, this diagnosis should always be suspected strongly in a patient who has recently received blood transfusions.

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* This patient was seen in consultation with Dr. Alvin Rosenberg of Morristown, N.J.

Case 8*

A 69-year-old woman was hospitalized for anemia and a 24-pound weight loss over a two-month period. Physical examination showed mild splenomegaly, and laboratory study revealed a white blood count of 3000 per mm^3 with a normal differential count. First and second strength tuberculin tests were negative. Liver biopsy revealed a small number of polymorphonuclear leukocytes. Because of these findings, a laparotomy was performed. This showed hepatosplenomegaly, and open liver biopsy again revealed polymorphonuclear leukocytes in modest numbers. Cultures of the liver biopsy were negative. Fever persisted for two more months despite intensive antibiotic therapy, and the spleen increased in size. Innumerable blood cultures were sterile, and a third liver biopsy was interpreted as pericholangitis. Despite additional antimicrobials, the relentless deterioration continued. At autopsy, the spleen and liver showed many Reed-Sternberg cells characteristic of Hodgkin's disease.

Comment: This difficult case emphasizes that even multiple negative biopsies do not eliminate the possibility of an infiltrating lymphoma. In this case, splenectomy was attempted at the time of laparotomy, but this attempt had to be abandoned because of hypotension. In retrospect, the clue was the white blood cell count. In ascending cholangitis or pylephlebitis, it is rarely this low. Modest leukopenia and moderate splenomegaly in an older person is lymphoma or tuberculosis until proved otherwise.

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* This patient was seen in consultation with Dr. Bernard Brill of Brooklyn, N.Y.

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It is certainly a one-sided opinion — even though generally adopted at the moment — that all infectious agents which are still unknown must be bacteria. Why should not other microorganisms just as well be able to exist as parasites in the body of animals?

Robert Koch (1843-1910) *Zur Untersuchung von pathogenen Organismen, 1881*
(tr. by Max Samter)

RECOVERY FROM ACUTE INFECTION

• In this era of antibiotic therapy, the clinician must not overlook the natural evolution of the disease process and recovery from infection.

LEIGHTON E. CLUFF, M.D.

Infection, infectious disease, and illness are not synonymous. Infection, with few exceptions, indicates microbial replication and invasion. In some instances, infection is demonstrable only by evidence of the hosts' immunological response, as illustrated by a positive tuberculin test or positive specific serum antibody titer. At times replication may occur without microbial invasion, as in diphtheria. Infectious disease indicates the pathological or pathophysiological process resulting from infection and producing manifestations such as fever, leucocytosis, inflammation, or tissue necrosis. Not all patients with infection or an infectious disease are sick or ill. For example, tuberculosis of the lung may develop with x-ray and bacteriological findings, but the patient may feel well. Symptoms of illness associated with an infection may be clearly attributable to demonstrable disease, may be present before the disease becomes manifest, or may persist after the infection has disappeared. The absence of demonstrable infection or disease, however, does not necessarily mean that symptoms of illness are unreal.

Attention will be focused upon recovery from infection (microbial replication and invasion), recovery from disease, and recovery from illness. In many instances these can be equated, but in other instances they cannot. Furthermore, the factors influencing and responsible for recovery from infection often differ from those responsible for recovery from disease and illness.

Recovery from Infection

The determinants of host resistance and susceptibility also affect recovery from infection. These include factors responsible for nonspecific and specific or acquired resistance. Diabetic acidosis, agranulocytosis, immunological deficiency, vascular insufficiency, and other diseases adversely affecting phagocytes or immune responsiveness, for example, not only predispose patients to infection by many different microorganisms, but recovery occurs slowly if at all in these patients with infection unless the defect in resistance is corrected or the underlying disease is remedied. Once microbial replication begins and invasion takes place, mobilization of host resistance is essential to prevent progress and to initiate recovery from the infection.

Antimicrobial drugs certainly can terminate growth or kill microorganisms and contribute to recovery from infection. But if the microorganisms are not killed, host resistance is particularly important to prevent reemergence of infection after discontinuing the antimicrobial drugs. Relapse after treatment of tularemia with tetracycline,[1] relapses from bacterial endocarditis treated with bacteriostatic rather than bactericidal drugs, and remergent tuberculous infection treated for an inadequate period of time with INH or streptomycin are illustrative of dependency upon host resistance in recovery from infections treated with bacteriostatic drugs. Similarly, admin-

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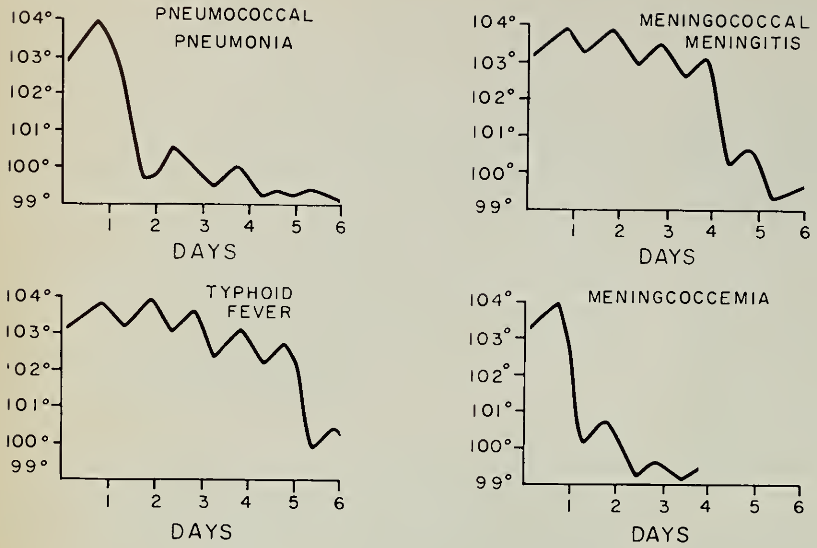

Figure 1

Variable but usually expected defervescence following specific antimicrobial therapy of different infectious diseases.

istration of tetracycline or chloramphenicol to patients incubating tularemia or Q fever infection may prevent progression of the infection, but disease occurs when the antibiotic is discontinued.[2,3]

Termination of microbial replication, therefore, is not always synonymous with cessation of infection. Persistence of infection[4] without progressive microbial replication or further invasion is a problem in chronic infections such as tuberculosis, syphilis, malaria, brucellosis, histoplasmosis, and *Herpes simplex* infection, for example. These persistent infections may be the source of relapsing or advancing disease when natural resistance declines. Many of these persistent infections are associated with intracellular parasitism, and some are associated with appearance of atypical bacterial forms, protoplasts, spheroplasts, or L-forms. The mechanisms responsible for microbial persistence are not known, but these infections are becoming increasingly important in aged persons and other patients with impaired resistance to infection. Unfortunately some bacteria assume atypical form or become protoplasts with defective or absent cell walls under the influence of antimicrobial drugs, particularly penicillin, which act by interfering with cell wall synthesis. Microbial persistence is an interesting and important problem associated with the use of antibiotics. Attenuated or altered microorganisms may persist in tissues after infection to reemerge later as sources of progressive disease. Recovery from infection, therefore, implies eradication or elimination of the infecting microorganism and its variants and not only cessation of microbial replication.

Recovery from Disease

The pathological processes set in motion by different infections do not evolve, progress, or resolve in the same way. The pathological or pathophysiological events associated with infectious diseases do not disappear during recovery in the same way or at the same rate. For example, fever may disappear long before elimination of the microorganisms or resolution of the pathological lesion. The pathological lesion may subside before the affected patient's weight returns to normal. The patient may continue to feel ill after all objective manifestations of the disease have disappeared.

Traditionally it is considered wise to know the natural history of a disease to enable prognostication and to temper expectations during the course of disease. As the course of many infectious diseases can now be influenced by antimicrobial drug therapy, however, it is equally important to know the course of treated infection. Figure 1, for example, illus-

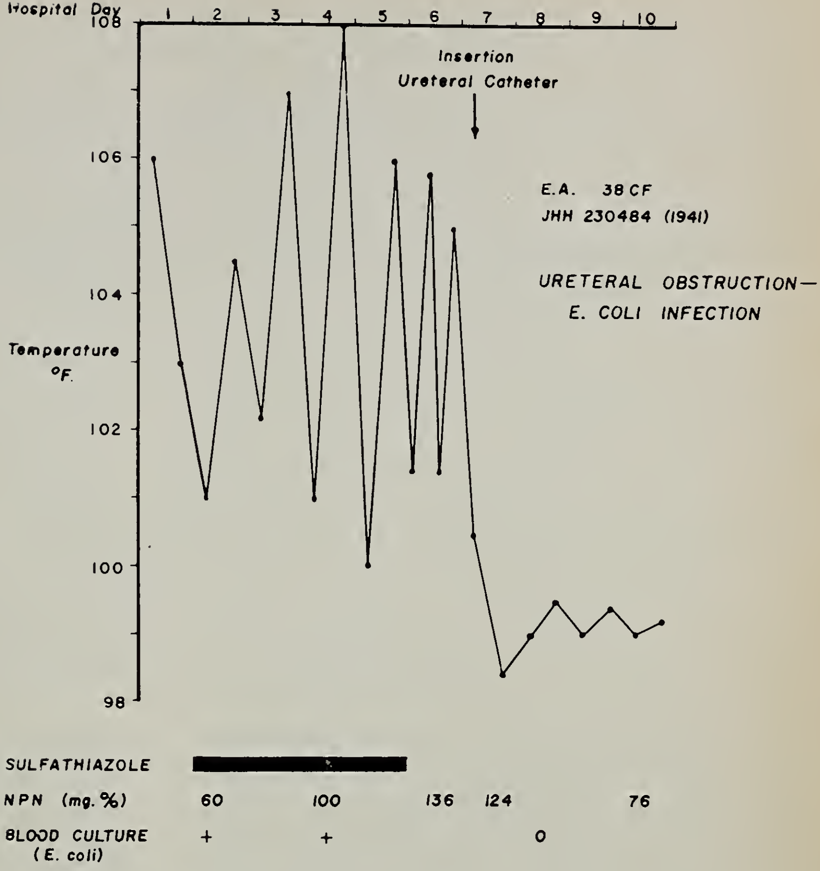

Figure 2

Removal of obstruction to drainage essential to recovery from an infectious disease. Diabetic patient with E. coli urinary tract infection, obstructed ureter and bacteremia.

trates the type of defervescence ordinarily expected following administration of an effective antibiotic to patients with typhoid fever, pneumococcal pneumonia, meningococcemia and meningococcal meningitis. Rarely will patients with typhoid fever become aferbrile in less than three to five days, while patients with pneumococcal pneumonia may be afebrile in less than 12 to 24 hours. Defervescence in patients with meningococcemia is ordinarily much more rapid than in patients with meningococcal meningitis, illustrating that localized suppuration impedes the rapidity of response after beginning treatment. The reasons for this variability in recovery from treated infection are not well understood. At times it is related to chronicity or intracellular parasitism characteristic of the infection. Most important, however, recovery occurs slowly if at all following initiation of antibiotic treatment if an obstructed or undrained abscess is present. (Figure 2) Similarly, infection involving a foreign body may persist or recur despite drug administration. Drainage of the abscess and removal of the foreign body will have more effect upon recovery than administration of antibiotics. Rarely is the ineffectiveness of antimicrobial treatment in these circumstances attributable to failure of drug penetration into the site of infection.[5]

The rate of defervescence also may vary significantly in patients treated for the same type of infectious disease. Figure 3 illustrates the four principal patterns of defervescence in patients with pneumococcal pneumonia. Defervescence in 12 to 24 hours, two to three days or after four to five days is observed in about one-third of patients respectively. A few patients may defervesce promptly but have recrudescence of fever after five to ten days. This recrudescent fever may be caused by a pyogenic complication of the infection, such as pyoarthritis or empyema, but this rarely occurs if the complication was not present when penicillin therapy was begun. In most in-

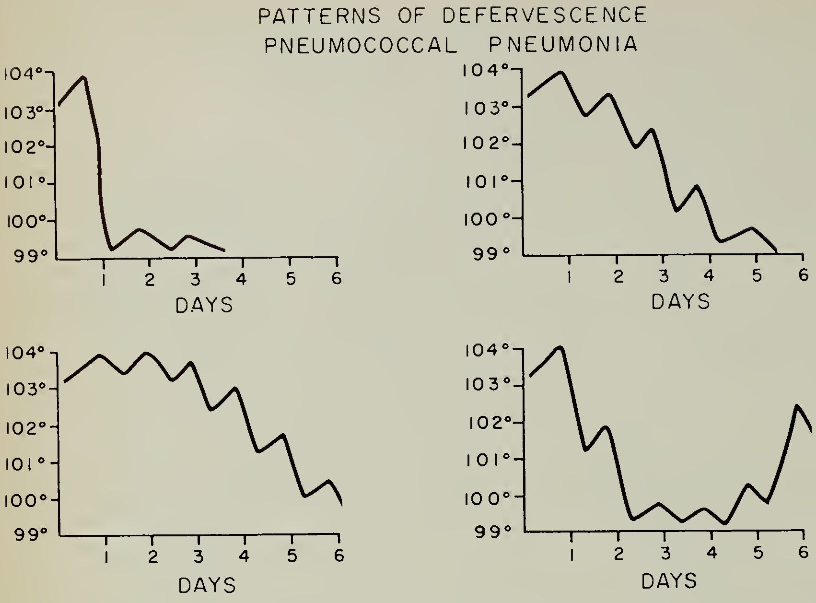

Figure 3

Variability in defervescence in uncomplicated pneumococcal pneumonia treated with penicillin.

stances, such recurrent fever is attributable to drug fever.[6] The reasons for the other variable patterns of defervescence often are not apparent. The speed of defervescence, however, is related to the duration of disease before beginning antibiotic therapy. There is an almost direct relationship between the duration of disease prior to administering antibiotics and the days required for the patient to become afebrile. Awareness of this variability conditions the physician's expectation, avoids unnecessary concern, reduces the dilemma associated with changes in sputum bacteriology, and eliminates unjustifiable alterations in antibiotic therapy. The patient who has had pneumonia for four days before starting penicillin follows the usual pattern of recovery if he continues to have fever on the second or third day of therapy.

Unfortunately antibiotic administration may initiate recovery from one manifestation of an infectious disease without altering another and without eliminating the infection. For example, streptococcal pharyngitis and its suppurative complications may resolve after sulfonamide or tetracycline therapy, but the streptococcus may persist in the pharynx and rheumatic fever may supervene. On the other hand, penicillin therapy may provide no other benefit to the course of the pharyngitis or its suppurative complications but can eradicate the streptococcus and prevent rheumatic fever.

Unfortunately, antibiotic treatment of the patient with an infectious disease may delay as well as facilitate recovery. Large doses of antibiotics may alter the normal balance between bacteria of skin and mucous membranes allowing resistant microorganisms to replicate and superinfect. In addition, antimicrobial drugs can produce adverse pharmacologic or allergic reactions. Diseases caused by these drugs frequently are responsible for delayed recovery from infectious diseases.

Antimicrobial drugs can eradicate microorganisms but have no effect upon resolution of disease processes. Once injury from infection occurs, elimination of the microbe may prevent further injury, but return to normality is dependent upon other events. Antibiotics cannot resolve inflammation, tissue necrosis, or pathophysiological processes. The affected host must have recuperative powers, or measures other than antimicrobial therapy must be used. The lesion of pneumonia, anthrax, tularemia, streptococcal pharyngitis, leptospiral hepatitis, and so on will resolve at a predictable rate whether the infection is terminated with or without antimicrobial therapy. Similarly, death from pneumonic plague, fulminant meningococcemia, pneumococcal bacteremia and many other infections may not be prevented, even when the infection is terminated, if the pathophysiology of the disease progresses beyond a certain point. There are events, therefore, responsible for recovery or continued deterioration not determined by progression of infection and not reversed by termination of the infection. The inflammatory, hematological, hemodynamic, neural, renal, hepatic, and other processes set in motion by infection must be reversed naturally or therapeutically to facilitate recovery from disease initiated by infection but not dependent upon its progression. The growing interest in consumptive coagulopathy and the cardiovascular effects of sepsis, and the means to manipulate these effects is illustrative of our appreciation that the disease of infection is more than microbial replication and invasion.

Recovery from Illness

Premonitions of being sick, variability in severity of illness, and differing speeds of returning to normal health occur in patients with an infectious disease. Often this is related to the intensity of infection, the severity of the disease, and rate of resolution of the pathological process. Certainly the patient developing cirrhosis of the liver as a result of hepatitis often will continue to feel ill, and patients developing influenzal pneumonia might remain ill longer than patients who have uncomplicated influenza. Even with these differences, however, there is great variation in the speed of convalescence from illness among patients with disease of similar severity.

Patients with uncomplicated influenza may return to a feeling of good health within seven days, but some may continue to feel ill for three weeks or more.[7] Brucellosis often has been held responsible for chronic ill health after recovery from the acute disease.[8] Patients recovering from infectious mononucleosis and malaria have had lingering disability after manifestations of disease have subsided.[8,10] All infections and many other diseases probably are associated with delayed recovery to normal health in some patients.[11]

Prior to the influenza pandemic of 1957, we began to examine the reasons for delayed recovery from illness associated with this disease. Approximately 600 employed, active individuals under continuing care in one clinic were evaluated clinically and psychologically several weeks before appearance of influenza. The Asian strain of influenza virus responsible for this pandemic had not previously affected the population, and negative specific serological titers to the viral antigen were found uniformly. Vaccine available prior to the appearance of the influenza outbreak was generally of little value and had no effect upon rates of influenzal infection.[12] In about 26 of the individuals who came to the clinic during the outbreak with disease typical of influenza, virus was isolated or at least a four-fold rise in specific serum antibody titer was observed. These individuals were followed to evaluate their disease and symptoms of illness. About one half of the patients were free of symptoms within seven days, while most of the other half still felt ill at three weeks. There was a distinct grouping of the patients, and only two individuals had illness persisting for an intermediate period of time. The ages of the two groups were similar; no underlying or associated diseases differentiated them; the height and duration of fever in the two groups were the same; disease complications (pneumonitis and otitis media) occurred rarely and with the same frequency in patients of each group; the immune response as measured by elevation in serum antibody titer was the same in each group. There were, in essence, no clinical or laboratory changes which explained the delay or speed of recovery in the individuals.

The psychological data from each person in the study prior to the influenza outbreak was obtained by the Minnesota Multiphasic Personality Inventory, the Cornell Medical Index, and a social questionnaire. This data was analyzed and interpreted before the outbreak of influenza and independent of the clinical study. Characterization of the patients identified as having influenza, using the data collected before the pandemic, revealed that almost all patients recovering slowly from their illness had a "depressive propensity." With a high degree of accuracy, it would have been possible to predict before the outbreak which persons would have lingering illness following the infection.[7]

The major persisting symptoms in patients recovering slowly from influenza were tiredness, weakness, insomnia, headache, anorexia, and feeling "blue.' Myalgia, arthralgia, malaise, and anorexia were common symptoms during the acute disease. The protracted illness merged imperceptibly with the symptoms of the acute illness.

It might be concluded that the delay in recovery from illness was attributable to the "depression propensity" and that the symptoms were interpreted by the patient as related to the influenza. Certainly the "depression proneness" was identified before the acute infection, and the persistent symptoms were those usually associated with depression. On the other hand, the persisting symptoms could be attributable to subtle manifestations of disease undetected by the evaluation methods.

Influenzal illness was reported by 12% of all patients identified as being "depression-prone," but only by 3% of all other individuals.[12] This suggested the possibility that the former group might be more susceptible to influenzal infection.

Serological examinations obtained before and after the epidemic in the "depression-prone" and other individuals, however, revealed an infection rate in the "depression-prone" group of about 40%, and about 34% in all others. The difference between these rates of infection was not statistically significant, indicating that susceptibility to infection was not different in the two groups. These observations suggested that the disease in "depression-prone" persons might be more severe when infection occurs, but the clinical observations of the two groups of patients presenting with influenzal illness did not show any differences in severity of their disease. The possibility developed that the "depression-prone" individuals were more likely than others to report sickness when infected, indicating a heightened awareness of disease.

Several additional observations have further suggested the heightened awareness by "depression-prone" individuals of the presence of disease. The questionnaires completed before the epidemic showed an increased awareness by these persons of disease in distant family members; previous visits to the clinic for common problems (diarrhea, constipation, common cold, etc.) were more common; and previous complaints about reactions to vaccination were more frequent.[13,14] A subsequent prospective study of reactions to vaccination in the two groups confirmed their increased reporting or awareness of adverse vaccine reactions but no measurable differences in the objective manifestations of vaccine reactions in the "depression-prone" persons contrasted with other individuals.

The sum and substance of these studies, therefore, support the conclusion that persons identified as "depression-prone" have no increased susceptibility to infection, no increased severity of infectious disease, delayed recovery from symptoms of illness, and a heightened awareness of disease in themselves and others. This increased awareness might be equated to an enhanced reactivity to disease. It probably is not appropriate to imply that this is entirely caused by psychological determinants. It seems equally possible that the so-called "depression proneness" is only another manifestation of enhanced physiological responsiveness. Conceivably future studies will reveal a biological difference between these groups of individuals manifested by varied physiological reactivity or a different responsiveness to stimuli. Perhaps the difference between these groups of persons may be reflected in variable effects of pharmacologically active drugs.

Weakness and tiredness are the most common persistent symptoms in persons recovering slowly from influenza. Myalgia and weakness are major manifestations of the acute disease. Possibly the persistent symptoms are the expression of gradually resolving neuromuscular disease common in all patients with influenza, but appreciated only by those with an increased awareness of the presence of disease. Other studies are required to clarify these and other questions.

Summary

Infection is defined as microbial replication and invasion of a host. Infectious disease is defined as the pathological and pathophysiological processes caused by infection. Illness is defined as the symptoms appreciated by the infected individual. Infection can occur without detectable disease, and disease may persist or resolve long after infection has been eliminated. At times infection may persist without progression of disease, and there are instances where persistence of infection may lead to delayed consequences, either by emergent infectious diseases or by late noninfectious sequelae. Treatment of infection is important in control of infectious disease, but once the pathological or physiological processes set in motion by infection develop, elimination of the microorganism may not be accompanied by enhanced recovery.

There is considerable variability in recovery of patients following antimicrobial drug treatment of an infection. Awareness of this variability between infectious diseases is essential to avoid confusion in interpreting microbiological, serological, and clinical findings, and to prevent unnecessary changes in antimicrobial drug therapy.

Patients vary in their speed of recovery from an infectious disease. Often this is related to complications or severity of the process. Often, however, persistent symptoms of ill health are not explainable in this way. There is a relationship between awareness and reporting of disease by individuals, "depression-proneness," and speed of recovery from illness. Conceivably, this could be related to variable reactivity to different endogenous and exogenous stimuli.

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* * *

SIR CHARLES SINGER (1876-)

Our knowledge of health and of disease thus depends on the sciences as a whole — nay, on Knowledge as a whole. Those who would promote the health of mankind would do well if they sought to encourage not so much the medical sciences as Science as a whole, or rather Learning as a whole, for Science is a way of life which may penetrate into all departments of Learning, and is something far greater than those discrete accumulations of knowledge that we call "the sciences." The Sciences, working out their destiny, must in the end come together again.

A Short History of Medicine, Epilogue

DIFFERENTIATION OF UPPER FROM LOWER URINARY TRACT INFECTIONS

• The primary physician treating patients with urinary tract infection should be made aware of the importance of determining whether a particular patient is suffering from urinary tract infection localized to the lower tract or if such infection also involves the kidney.

Marvin Turck, M.D.

The differentiation of renal from bladder bacteriuria is difficult on clinical grounds alone especially in the asymptomatic patient. Since recognition of renal involvement may be useful not only in defining groups of patients for epidemiologic and therapeutic studies, but also for guiding the duration and intensity of treatment in an individual patient, an accurate laboratory method for localizing the site of urinary tract infection is needed. To date, only bilateral ureteral catheterization has been shown to localize infection with relative certainty.[1,2] However, ureteral catheterization cannot be justified for the routine evaluation of patients with recurrent bacteriuria, and there has been a continued search for less cumbersome methods of localizing infection.

Materials and Methods

One hundred patients, 97 women and three men, with well documented recurrent infections of the urinary tract were subjected to bilateral ureteral catheterizations employing methods previously described from this laboratory.[2] All these patients had previously received several courses of antimicrobial therapy with various agents, but infection had persisted or recurred. Extensive urologic evaluation had not revealed surgically remediable lesions or obstructive uropathy in most patients. However, nine had renal calculi or nephrocalcinosis, and vesicoureteral reflux was found in an additional three women. All but two of the patients had serum creatinine values below 1.5 mg per 100 ml. The majority of patients were asymptomatic at the time of ureteral catheterization, and none had acute clinical pyelonephritis.

The purpose of the present report is to correlate the site of infection with the results of three techniques, 1) serum antibody response, 2) maximal urinary concentrating ability, and 3) urinary beta-glucuronidase activity, which have been employed in our laboratory in an attempt to distinguish between upper and lower urinary tract infection. The methods used for selection of patients and performance of these tests have been described in detail in previous publications from this laboratory.[3-5]

Results

Results of Serum Antibody Response. The results of hemagglutinating antibody titers determined in 79 patients are summarized in Figure 1, which also depicts the species of organism cultured from these patients at the time of bilateral ureteral catheterization. When the antibody titer of serum was compared with the site of infection, most patients with a renal origin for their bacteriuria tended to have a distribution of titers similar to that

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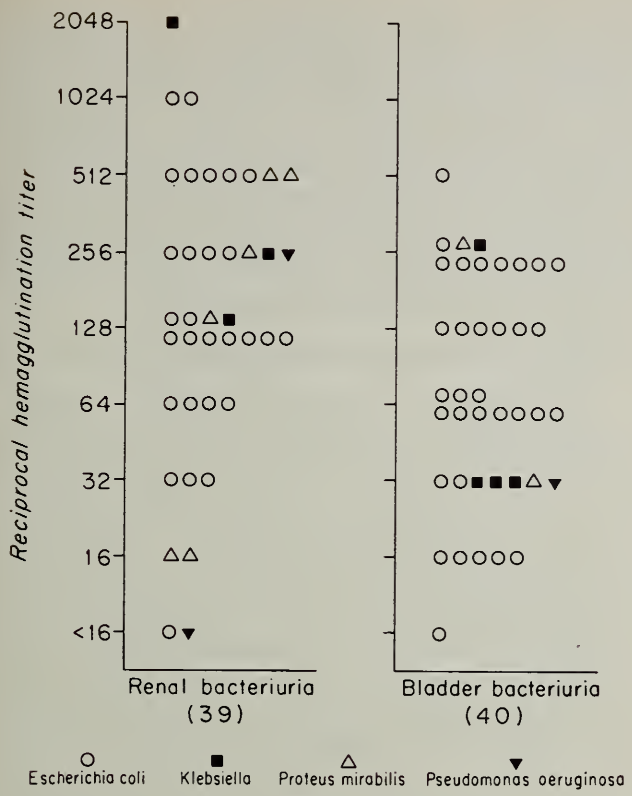

Figure 1

Reciprocal Hemagglutination Titers in Serum in Patients with Bacteriuria. (Reprinted with permission. Ref. 3.)

found in patients with infection confined to the bladder. However, titers equal to or greater than 1:512 were significantly more frequent ($p < .05$) in patients with renal bacteriuria; and titers in serum of 1:512 or greater were found against 10 of 39 organisms in patients with renal bacteriuria, whereas only one of 40 with infection in the lower tract had an antibody response of this magnitude. However, a titer in serum of 1:512 was an arbitrary distinction, and was the only value at which a significant difference was seen between patients with renal and bladder bacteriuria.

The results of residual hemagglutinating antibody titers found after addition of 2-mercaptoethanol are summarized in Figure 2. It can be seen that this procedure was no more discriminatory than tests of hemagglutinating activity in untreated serum. However, similar to the results observed with whole serum, residual antibody activity after 2-mercaptoethanol treatment was greater in some patients with a renal origin for their bacteriuria, and 22 of 39 with upper tract involvement and 12 of 40 with bladder bacteriuria ($p < .025$) had residual titers of 1:32 or greater.

Results of Maximal Urinary Concentration Studies

The results of maximum solution concentration (U_{max}) determined in 66 patients are summarized in Figure 3. With the technique employed in the present study, most normal individuals achieve a U_{max} greater than 900 mOsm/kg, and values of U_{max} below 800 mOsm/kg are considered abnormal and signify an impairment in the capacity to excrete a maximally concentrated urine. It can be seen that 24 of 31 patients with infection limited to the bladder had a U_{max} greater than 800 mOsm/kg. Eight of the 31 had a U_{max} greater than 1,000 mOsm/kg, and 16 more concentrated between 800 and 1,000 mOsm/kg. On

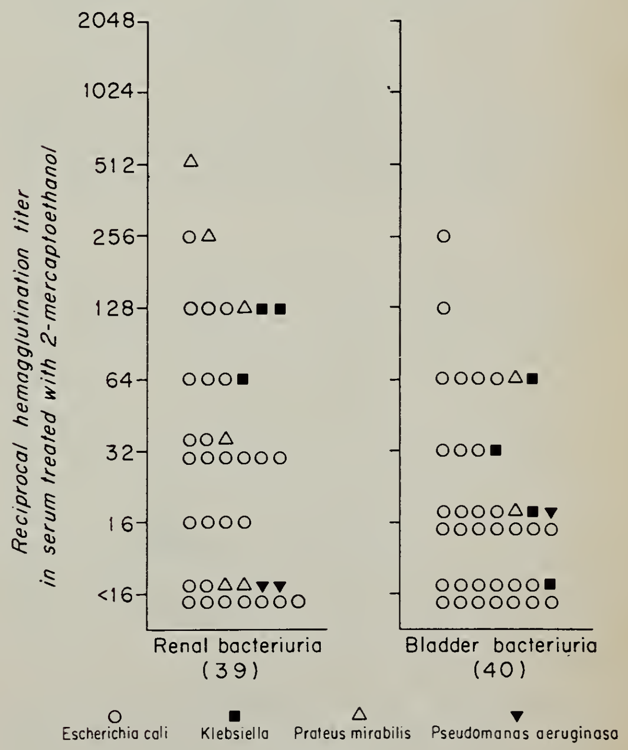

Figure 2

Reciprocal Hemagglutination Titers in Serum Treated with 2-Mercaptoethanol in Patients with Bacteriuria. (Reproduced with permission. Ref. 3.)

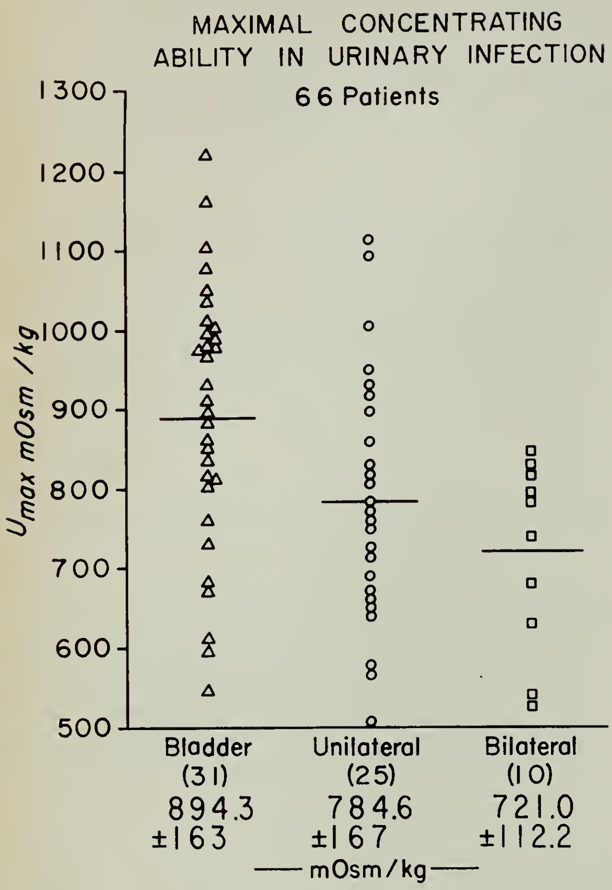

Figure 3
Maximal Concentrating Ability in Patients with Recurrent Bacteriuria Correlated with the Site of Infection. (Reproduced with permission. Ref. 8.)

the other hand, 14 of 25 patients with unilateral infection and 7 of 10 with bilateral involvement failed to concentrate above 800 mOsm/kg. Furthermore, none of 10 patients with bilateral renal bacteriuria concentrated to 900 mOsm/kg. Comparing the mean values of U_{max} in bladder with renal bacteriuria, individuals with bladder infection (894 mOsm/kg) concentrated significantly better than patients with either unilateral (784 mOsm/kg) or bilateral (721 mOsm/kg) renal bacteriuria ($p<.025$, $p<.005$).

The results of differential U_{max} in 24 patients with bladder bacteriuria and 19 with unilateral infections studied during the period of maximal antidiuresis are summarized in Figure 4. Overall, there were no consistent differences between left and right kidneys among patients with bladder bacteriuria. On the other hand, in patients with unilateral renal bacteriuria the infected kidney generally excreted urine with a lower U_{max} than did the noninfected side ($p<.005$). The difference exceeded 100 mOsm/kg in 13 of 19 patients with unilateral renal infection. Furthermore, only one patient with unilateral renal bacteriuria failed to achieve a more concentrated urine on the noninfected side.

Results of Urinary Beta-Glucuronidase Activity

The results of beta-glucuronidase activity determined in 21 patients with bladder bacteriuria, 25 patients with unilateral or bilateral renal bacteriuria, and 46 normal individuals, are summarized in Figure 5. The mean beta-glucuronidase activity in the urine of 46 control subjects was 5.1 ± 2.9 units with the accepted upper limit of normal (99% confidence limit) at 13.5 units. This did not differ significantly from the activities in urine of patients with bladder bacteriuria (6.6 ± 3.1 units) or renal bacteriuria (8.7 ± 5.3 units). Although not depicted in the Figure, 14 patients with unilateral renal bacteriuria had levels of activity in their urine comparable to 11 patients with bilateral involvement. Furthermore, the activity in urine from the infected side in patients with unilateral infection did not differ significantly from the activity in the noninfected side. Although four patients with renal bacteriuria (three with unilateral and one with bilateral infection) did demonstrate activity in their urine above 13.5 units, two of these patients had diabetic glomerulosclerosis, one had a renal calculus, and one was found to have a bladder carcinoma in addition to upper tract bacteriuria.

Discussion

The findings in these ongoing studies provide several pieces of information concerning the differentiation of renal from bladder bacteriuria in asymptomatic patients. Firstly, in general, patients with renal bacteriuria, either unilateral or bilateral, were found to have higher antibody titers than did patients with infection localized to the bladder. However, because of the wide range of titers, determination of hemagglutinating antibody activity was only of limited usefulness in predicting

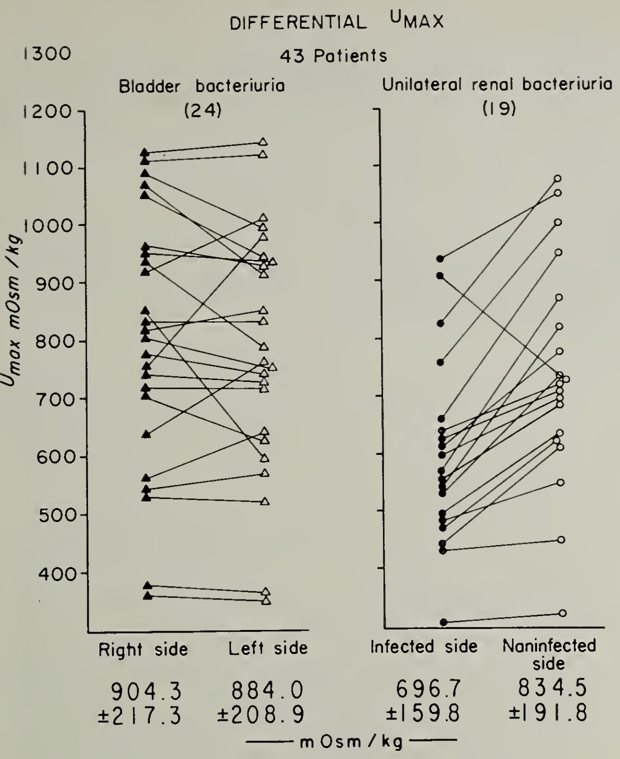

Figure 4

Differential Maximal Concentrating Ability in Patients with Bladder Bacteriuria and Patients with Unilateral Renal Infection. (Reproduced with permission. Ref. 8.)

the site of infection in individual patients with asymptomatic urinary tract infection. Perhaps, the main clinical application of determination of the serum antibody activity may be in epidemiologic and therapeutic studies of groups of patients with asymptomatic bacteriuria. Coupled with studies of maximal urinary concentrating ability, it remains possible that more sensitive and precise methods of determining antibody activity may be employed to select those patients more likely to have renal involvement.[6,7]

Secondly, our findings demonstrate that renal infection, even in the asymptomatic patient with normal or only slightly impaired creatinine clearances, often is associated with impairment of ability to excrete a maximally concentrated urine. These data also support the expectation that infection of the bladder per se generally is not associated with impaired concentrating ability. In addition, other studies not reported herein have demonstrated an improvement in U_{max} following successful antibiotic treatment of renal but not bladder bacteriuria.[8] Furthermore, the observation that in unilateral upper-tract infection, the maximal concentration of urine was not reduced on the noninfected side, strongly implicates the presence of bacteria in the concentrating abnormality. It is conceivable that the mere presence of gram-negative microorganisms in the renal medulla may interfere with U_{max}, apart from causing any permanent destruction in renal mass or inciting any marked inflammatory response. Whatever ultimately is determined to be the cause of the concentrating defect, the results of our studies suggest that it is largely reversible with effective antimicrobial therapy and provide a rationale for treatment of patients with renal bacteriuria even when they are free of symptoms.

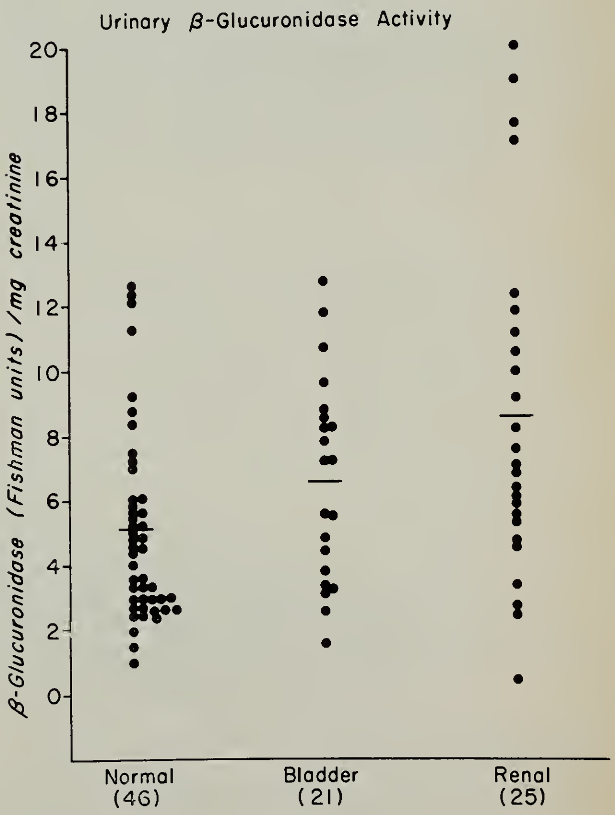

Figure 5

Urinary Beta-Glucuronidase Activity in Normal Subjects and Patients with Urinary Tract Infection. (Reproduced with permission. Ref. 5.)

Finally, the results of the present studies demonstrate that unlike the findings observed in patients with active pyelonephritis,[9] asymptomatic patients with renal bacteriuria do not have elevations of urinary beta-glucuronidase activity. An associated abnormality of the urinary tract or concomitant renal parenchymal disease was present in the only four patients in our study who did have elevated enzyme activity. In experimental models of pyelonephritis, elevations in the excretion of beta-glucuronidase were observed primarily in animals with severe inflammatory disease.[10] If these observations in experimental animals are applicable to the situation in man, it appears that most patients with asymptomatic bacteriuria emanating from the upper tract have a minimal inflammatory response in the renal parenchyma. However, it is also possible that asymptomatic patients defined as having upper tract infection by ureteral urine culture may have involvement only of the ureter or renal pelvis. If the infections were luminal or superficial, such patients might more closely resemble patients with infection confined to the bladder. In either case, it appears unlikely on the basis of these findings that determination of beta-glucuronidase activity will find much place in differentiating renal from bladder bacteriuria in most patients with urinary tract infection.

ACKNOWLEDGMENTS

Many physicians participated in the design, implementation, and interpretation of these studies. I would like particularly to express my appreciation to Dr. Allan R. Ronald and Dr. H. Clark for their splendid efforts in these studies.

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W. I. B. BEVERIDGE (1908-)

John Hunter deliberately infected himself with gonorrhoea to find out if it was a distinct disease from syphilis. Unfortunately the material he used to inoculate himself contained also the syphilis organism, with the result that he contracted both diseases and so established for a long time the false belief that both were manifestations of the same disease.

The Art of Scientific Investigation, Ch. II

THE DIAGNOSIS AND MANAGEMENT OF URINARY INFECTION IN FEMALES

• Urinary tract infections occur frequently in female patients and present a wide spectrum of clinical syndromes. Recognition of such infection and localization in the urinary tract are important for successful treatment.

Allan R. Ronald, M.D.

Bacterial infections of the urinary tract in adult females are among the commonest indications for antimicrobial therapy in medical practice. Whereas most acute infections are self-limited, urinary infections frequently persist and recur, despite multiple urologic procedures and extensive prolonged therapeutic regimens. This review is concerned with an approach to the investigation and treatment of urinary infection in females that, if followed, may result in more rational management.

Prevalence Studies

Prevalence studies in healthy populations have delineated segments of the population with an increased risk of urinary infection. In school age and adolescent girls, several studies have consistently given prevalence rates between 1 and 2%.[1] With marriage, the prevalence rate increases to between 3 and 6%.[2] Although parity has a minimal effect on increasing prevalence, many infections become symptomatic with pregnancy.[3] The prevalence is higher in women from lower socioeconomic groups.[4] Surprisingly, nuns have a frequency of bacteriuria much lower than their married counterparts.[2]

During 1970, 621 women were surveyed for bacteriuria at the time of their first prenatal visit to the Winnipeg General Hospital Prenatal Clinic. The prevalence of urinary infection, in most instances proven by catheterization, was unusually high with a rate of 9.8%. This population was further categorized into 176 of Indian ethnic origin and 445 who were not of Indian origin. The former group had a very high prevalence of 17.6%. This contrasts with a prevalence of 7.6% in the non-Indian population. No obvious explanation is known to account for the higher prevalence of bacteriuria in Indian population in this survey. Further studies are under way to document this prevalence and determine its significance.

Diagnosis

The diagnosis of urinary infection depends upon the demonstration of significant numbers of bacteria in a urine collected without extra-urinary contamination. Fortunately for purposes of diagnosis, most patients with infection have greater than 100,000 organisms/ml. Female patients, especially those with gram negative colonization of their perineum, often have voided urine with low counts, usually less than 10,000. In order to obtain maximum value from this differential, continued emphasis must be placed on proper collection and transport of urine cultures.

In alert, cooperative patients, a clean voided midstream urine is quite satisfactory if the patient understands the technique and is supervised. A single clean voided urine culture with $>10^5$ organisms/ml is about 80% accurate in predicting urinary infection. Two consecutive clean voided urine cultures containing

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the same pathogen in significant amounts increase the accuracy of diagnosis to almost 95%. In patients with unequivocal symptoms of acute urinary infection, one urine is adequate. However, in surveys and in the care of patients with low grade or asymptomatic infection, a second confirmatory culture should be obtained before initiating therapy. Gram positive organisms other than enterococci are rarely true urinary pathogens and should be confirmed by serial cultures or a catheterized sample. At room temperature, organisms in urine can double every 30 minutes. A few contaminants can quickly increase to 'significant' numbers. Unless the culture is planted immediately, refrigeration following collection is mandatory. Fortunately, most urinary pathogens are relatively hardy and survive at 4°C for 8 to 12 hours without any change in colony count or viability.

Localization of Infection

The localization of infection to exclude renal involvement in patients with no symptoms or lower tract symptoms only is increasingly important. Patients with renal infection are at greater risk from their disease and require more extensive investigation and prolonged therapy. The neomycin bladder washout test first described by Fairley[5,6] readily permits the localization of infection in female patients. This procedure is simple, does not require special urologic skills, and can be carried out by a nurse or other paramedical personnel. The bacteriologic techniques are those routinely used in most laboratories. In over 90% of the patients, interpretation of the results is straightforward. This test should be available to all physicians treating patients with recurrent urinary infection.

The urinary bladder is temporarily 'sterilized' following the neomycin bladder washout test. To our surprise, many patients were cured of their infection following localization without additional antimicrobial therapy. To date, of 49 patients with bladder infection only, 20 have been cured of that infection by the localization procedure.

The ease of eradicating bladder infection in females has suggested to us a therapeutic method to differentiate renal from bladder infection. Following localization with the neomycin bladder washout test, the patient was followed for recurrence of urinary infection. Patients cured with this test were not treated unless infection recurred. However, patients whose infection persisted were given a single injection of 500 mg of kanamycin. Eighty-seven patients have been studied to date. Thirty-five had lower infection by the localization technique. Thirty of these patients were cured with kanamycin. Five immediately relapsed with the same bacterial pathogen. The remaining fifty-two patients had renal infection. Thirty-six patients relapsed all within a few days of receiving kanamycin. Surprisingly, 16 patients with infection emanating from their ureters were cured with a single injection of kanamycin. Overall, of 41 patients who relapsed after kanamycin, 36 had upper tract infection. That is, seven of eight patients were correctly predicted by this diagnostic test to have renal infection. This means of differentiating renal from bladder infection deserves further study and may be a simple method for routine use in office practice.

Therapy of Urinary Infection

Urinary infections were adequately treated in most instances prior to the discovery of antimicrobics. Fluid, analgesics and bed rest usually resulted in rapid symptomatic relief. At present, 'wonder drugs' are often given unwarranted credit by both patients and physicians.

Several general principles are useful guidelines in the selection of an antimicrobic and the duration of therapy.

First, symptomatic relief correlates poorly with bacteriologic results. Infection often persists despite clinical improvement. For ultimate success, eradication of bacteria is more important than immediate symptomatic improvement. A urine culture should be obtained during therapy to assess the *in vivo* sensitivity to the antimicrobic and ensure that the organism has been eradicated.

Second, over 90% of uncomplicated acute urinary infections are caused by *Escherichia*

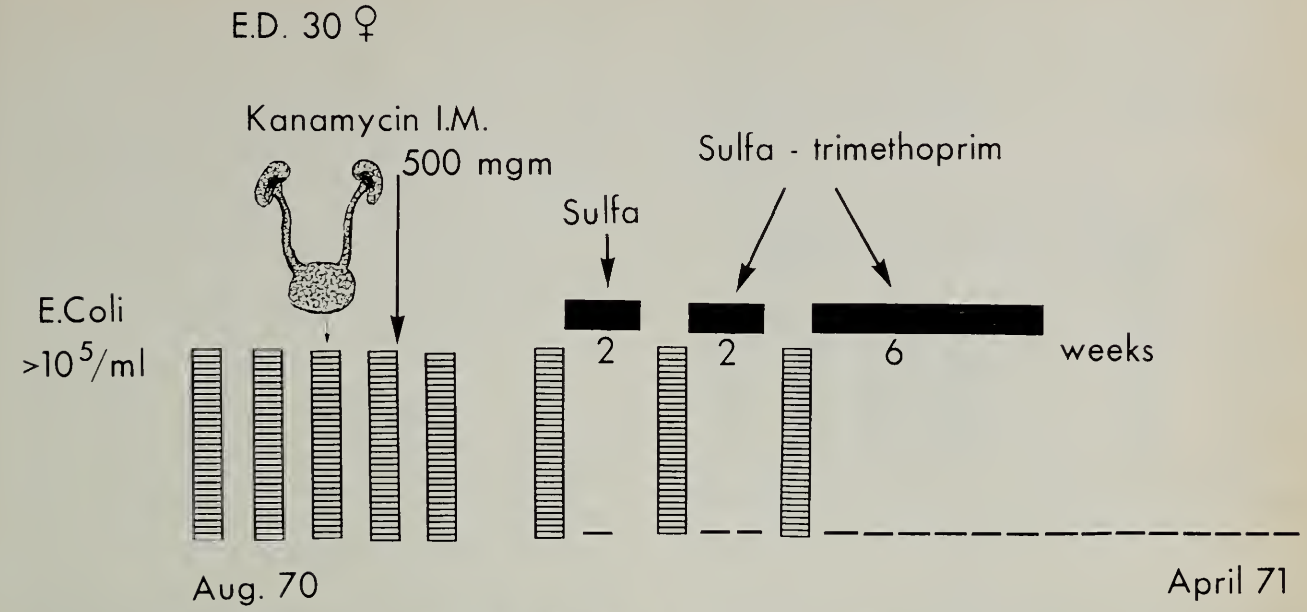

Figure 1 Recurrent relapsing urinary infection.

coli. A great many agents can successfully treat these infections, and the choice depends upon cost, side effects, mode of administration, individual idiosyncrasies, and the physician's personal experience. Few controlled studies are available conclusively showing one agent to be better than others if the infecting organism is eradicated during therapy.

Third, indiscriminate prolongation of therapy should not be routinely used in patients with repeated infection. If infection recurs following effective therapy, the site of origin of bacteriuria determines the duration of subsequent therapy. Prolonged therapy will not prevent multiple bladder reinfections and may alter the patient's bacterial ecology so that subsequent reinfections will be resistant to the drug the patient has been taking.

Specific therapeutic regimens for urinary infection will be discussed under the following headings:

1. acute pyelonephritis
2. acute cystitis & asymptomatic bacteriuria
3. recurrent bacteriuria
4. complicated urinary infection

Acute pyelonephritis: The patient is usually ill with flank pain, chills, and fever and may have bacteremia accompanying renal invasion. Hospital admission for initial therapy is usually indicated. An abdominal film is useful to exclude renal calculi and to check renal size. Renal function should be assessed with a BUN. Papillary necrosis frequently accompanies acute pyelonephritis, particularly in patients with a history of diabetes or analgesic abuse. Patients with acute pyelonephritis occasionally develop large cortical abscesses or a perinephric abscess that may require surgical drainage.

Optimal antimicrobial therapy for acute pyelonephritis should initially be administered parenterally. Ampicillin (1 gm q6h I.V.) or kanamycin (500 mg q12h I.M.) are the drugs of choice although sulphonamides still have some use. The patient should be afebrile by 72 hours and oral therapy with either ampicillin or nitrofurantoin continued for two weeks. A culture is obtained one week after therapy is completed and again in one month. In the absence of upper tract pathology, relapse (recurrence with the same bacterial pathogen) occurs in less than 10% of patients. Pyelography should be done during convalescence.

Acute cystitis and asymptomatic bacteriuria:

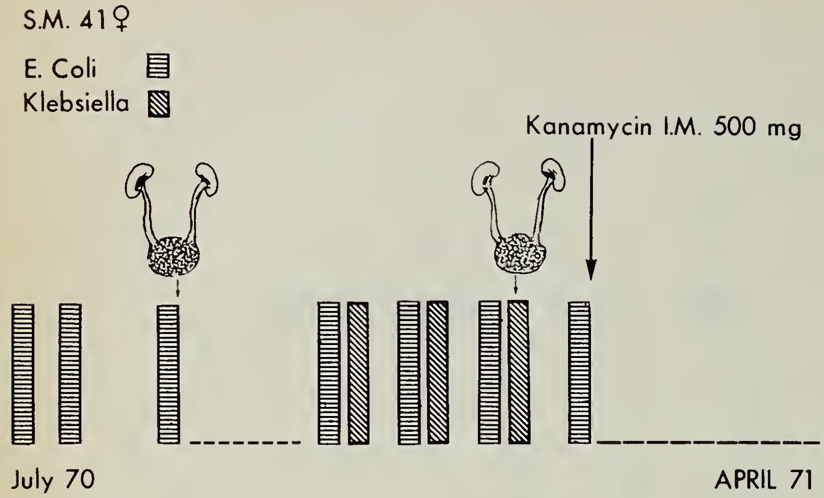

Figure 2

Recurrent reinfecting urinary infection.

Although temporarily distressing acute cystitis is usually a benign, self-limiting disease. However, if upper tract infection is present, further investigations and therapy are warranted. As discussed previously, we feel the simplest method to diagnose renal infection, is follow-up after a short course of therapy (three to five days) with an effective antimicrobic. A culture should be obtained during therapy to ensure eradication of infection. Oral agents are adequate, and one of the sulphonamides or nitrofurantoin is the therapy of choice. Whenever short-term therapy is used, follow-up cultures must be obtained in order to diagnose the patient with renal infection.

Recurrent infection: Despite eradication of infection during therapy, 20 to 60% of female patients will have recurrences sometime within a year following treatment. Many infections are asymptomatic and will be detected only if routine follow-up cultures are obtained. Rapid recurrences with the same organism (relapse) require a thorough assessment to rule out curable surgical lesions. Pyelography, cysto-urethrography, and sometimes cystoscopy may disclose congenital abnormalities. These studies should be done well initially with the first recurrence and should not be repeated unnecessarily.

Figure 1 depicts a patient with recurrent asymptomatic *E. coli* bacteriuria with the same strain, who had upper tract infection by localization and relapsed after kanamycin. She relapsed on two further occasions after short courses of antimicrobial therapy. The infection was finally eradicated with six weeks of therapy. Although no controlled evidence is available, six weeks of nalidixic acid has in our experience been particularly effective in patients with parenchymal renal infection.

Figure 2 presents a patient with a reinfecting recurrence. This 41-year-old pregnant female had a persistent bladder *E. coli* infection for several months. It was eradicated by the neomycin bladder washout test. Subsequently two months later, she recurred with urine cultures positive for both *E. coli* and *Klebsiella.* In our experience, double infections are unusual and should be documented with repeated cultures. On this occasion, localization again showed that both organisms were confined to the bladder. The *Klebsiella* was eradicated with the neomycin bladder washout, but the *E. coli* persisted and was not eradicated until the patient was given 500 mg of I.M. kanamycin. She has had no recurrences since. This patient demonstrates the ease of eradication of bladder infection in females. Most recurrences due to reinfections will respond to repeated short courses of chemotherapy. If these recurrences are infrequent, no specific measures other than an annual urine culture are necessary. For patients with several recurrences each year, preventive measures should be attempted. Currently, we recommend urinary acidification with ascorbic acid and methenamine mandelate to maintain an early morning urinary pH of 5.5. This presumably discourages bacterial growth in the urine and prevents reinfections. Patients whose reinfections appear to follow sexual exposure may be helped by one dose of prophylactic antimicrobic taken prior to intercourse. A tablet of penicillin 250 mg or nitrofurantoin 50 mg is an inexpensive regimen. Patients should also be instructed to void following intercourse.

Complicated urinary-infection: Patients with congenital urinary anomalies or neurogenic bladders with large residual urines cannot be treated satisfactorily with any drug regimens. Continuous 'suppressive' sulphonamide regimens are useful for patients with surgically irreparable lesions and may retard renal deterioration. Acute symptomatic flare-ups occur in these patients and should be treated with short courses of antimicrobic to which the organism is susceptible. If possible, a more susceptible organism should not be eradicated from the urinary tracts in these patients as 'success' will only result in replacement with more resistant organisms, particularly *Pseudomonas.*

Conclusions

Study of urinary infection in females can be rewarding combining bacteriologic principles with clinical skills. Although they frequently recur, the principles of management outlined in this review can provide a rational approach to a difficult problem.

ACKNOWLEDGEMENTS

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* * *

RENE DESCARTES (1596-1650)

It is true that the science of Medicine, as it now exists, contains few things whose utility is very remarkable; but without any wish to depreciate it, I am confident that there is no one, even among those whose profession it is, who does not admit that all at present known in it is almost nothing in comparison of what remains to be discovered; and that we could free ourselves from an infinity of maladies of body as well as of mind, and perhaps also even from the debility of age, if we had sufficiently ample knowledge of their causes, and of all the remedies provided for us by nature.

Discours de la Lethode, Pt. VI
(tr. by John Veitch)

METABOLISM AND LABORATORY STUDIES WITH INDANYL CARBENICILLIN

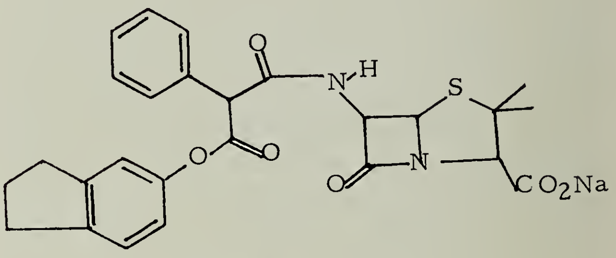
• A new ester of carbenicillin appears to be resistant to gastric acid. After oral administration therapeutic levels of the antibiotic are present in the urine.

Kenneth Butler, Ph.D.

Carbenicillin indanyl sodium is N-(2-carboxy-3, 3-dimethyl-7-oxo-4-thia-1-azabicyclo [3.2.0] hept-6-yl)-2-phenylmalonamic acid 5-indanyl ester, sodium salt, a new semi-synthetic penicillin. It is an acid-stable and readily absorbed derivative of carbenicillin, ie, one in which the original biologically active component is rendered useful for oral administration by masking a polar functional group of the parent drug to produce a more lipid soluble compound. In the case of carbenicillin indanyl sodium, this polar functional group is the α-carboxylic acid moiety of carbenicillin which is bound through ester linkage to 5-indanol.

Materials and Methods

In vitro studies. Carbenicillin indanyl sodium was used in the form of the crystalline mono-sodium salt, carbenicillin was used in the form of the amorphous disodium salt, and ampicillin was used as the trihydrate. The various micro-organisms utilized were either stock cultures that had been maintained in this laboratory for a number of years or fresh clinical isolates from hospitals in different geographical locations.



Tests of *in vitro* susceptibility were done by the conventional 2-fold serial dilution technique in Brain-Heart Infusion broth (Pfizer Diagnostics). The inoculum consisted of 0.5 ml of a 1 X10^{-3} dilution of an overnight culture incubated at 37 C. The tests were carried out in plastic DisPoso Trays (Linbro Chemical Co., New Haven), total final volume in each cup being 1 ml. The test was read visually, the minimal inhibitory concentration (MIC) being the lowest concentration of antibiotic preventing visual turbidity after overnight incubation of the culture at 37 C.

In vitro acid stability studies. A penicillin at 400 or 800 mcg/ml was added to synthetic gastric juice (pH 2.0), and the solution was maintained for one hour in a 37 C water bath. A 0.5 ml portion was serially diluted in B.H.I. broth through ten tubes and the tubes inoculated with 0.5 ml of a suitably diluted culture of *Staphylococcus aureus.* MIC values were read after incubation at 37 C for approximately 20 hours and compared with regular MIC values against the same test organism. The percentage loss of biological activity was calculated from the differences of MIC values.

In vivo studies. Experimental systemic infections were produced in mice by intraperitoneal inoculation of standardized bacterial cultures suspended in 5% hog gastric mucin.

Dr. Butler is Manager, Antibiotics for Human Infectious Diseases, Charles Pfizer and Company.

Table 1

In Vitro Antibacterial Activity Against Selected Bacterial Species

	Minimum Inhibitory Concentration mcg/ml (median values)		
	CP-15,464-2	Carbenicillin	Ampicillin
Staphylococcus aureus (5)	0.19	0.78	0.02
Staphylococcus aureus (400;)	25	12.5	200
Streptococcus pyogenes (8668)	0.0025	0.19	0.005
Streptococcus pyogenes (C203)	0.0012	0.19	0.002
Streptococcus faecalis	0.045	3.12	0.01
Diplococcus pneumoniae	0.02	0.39	0.002
Aerobacter aerogenes	3.12	6.25	100
Escherichia coli	3.12	3.12	3.12
Proteus vulgaris	3.12	3.12	3.12
Proteus mirabilis	1.56	1.56	3.12
Proteus rettgeri	12.5	3.12	200
Proteus morgani	12.5	6.25	>200
Pseudomonas (10490)	1.56	0.78	25
Pseudomonas aeruginosa (173)	50	75	>200
Salmonella typhosa	12.5	12.5	3.12
Klebsiella pneumoniae (132)	3.12	12.5	1.56
Klebsiella pneumoniae	200	3.12	—
Vibrio comma	3.12	200	1.56
Pasteurella multocida	0.19	0.09	0.09
Shigella sonnei	6.25	12.5	6.25

The severity of infection was consistently at 1-10 LD 100, ie, 1-10 times the number of organisms needed to kill 100% of the mice under the conditions of the experiment. The dose of antibiotic required to protect 50% of the mice (PD_{50}) was calculated in each experiment at 96 hours after challenge by use of a probit method.[1]

Experimental disease of the urinary tract in rats was produced with *Pseudomonas aeruginosa* 173, *Proteus vulgaris* 59 and *Escherichia coli* 028. The basic details of the technique used to produce infections with *P. vulgaris* and *P. aeruginosa* have been published previously in detail.[2] When the *E. coli* model was used, the infection was produced by ureter-ligation followed by intravenous administration of the infecting organism. In all instances, infected rats were treated orally once a day for eight days; the first dose was administered one day after challenge. Rats were sacrificed after completion of therapy, kidneys were removed and macerated, and the number of viable organisms was determined by plate counting. Such counts are expressed as the log average of the viable count.

Table 2

Carbenicillin Indanyl Sodium; Activity Against Clinical Isolates

	Number of Isolates	Antibiotic	Cumulative Percent Susceptibility: 3.12 and <	6.25	12.5	25	50	100	200	>200 mcg/ml
Pseudomonas aeruginosa	48	Indanyl Carbenicillin	4%	4%	8%	21%	29%	56%	69%	100%
		Carbenicillin	10%	19%	21%	25%	44%	73%	90%	100%
Proteus Indolepositive	48	Indanyl Carbenicillin	0%	45%	73%	100%				
		Carbenicillin	54%	54%	73%	73%	73%	100%		
Proteus mirabilis	9	Indanyl Carbenicillin	0%	44%	89%	100%				
		Carbenicillin	56%	89%	100%					
Escherichia coli	50	Indanyl Carbenicillin	16%	60%	92%	96%	96%	96%	98%	100%
		Carbenicillin	6%	18%	72%	80%	94%	96%	96%	100%

Antibiotic Assay Procedures.

The concentration of carbenicillin in serum samples was determined by a 5 cup cylinder plate assay with a double layer of agar (a layer of agar inoculated with *Pseudomonas aeruginosa NCTC* 10490 on top of a layer of plain agar). The sensitivity of this assay is 3-4 mcg/ml of carbenicillin in serum; this is the *standard* carbenicillin bio-assay. The standard curve for carbenicillin indanyl sodium closely resembles that for carbenicillin in this assay procedure, probably because of hydrolysis of the derivative to produce carbenicillin under the assay conditions. However, the levels of carbenicillin indanyl sodium in serum actually observed after oral dosage were too low to be detected by this method.

Differential Assay Procedure for carbenicillin and carbenicillin indanyl sodium in serum.

To 1.0 ml of serum was added 2 ml of reagent grade acetone to produce a heavy precipitate of serum proteins. The mixture was stirred intermittently with a rod for ten minutes, then filtered through a sintered glass funnel. The cake was washed well with small volumes of acetone and the filtrate and washings were combined (total volume circa 15 ml). To the acetone solution was added 1.0

	MIC (mcg/ml), Median Values; *Staphylococcus Aureus* BHI (pH 7.2)	Gastric Juice pH 2.0	% Loss of Activity at pH 2.0
Carbenicillin Indanyl Sodium	0.09	0.09	0%
Carbenicillin-Disodium	1.56	200	99.2%
Benzyl penicillin	0.06	200	99.9%

Table 3

Stability of Carbenicillin Indanyl Sodium in Synthetic Gastric Juice at 37 C for One Hour

TABLE 4

In vivo ACTIVITY OF CARBENICILLIN INDANYL SODIUM IN ACUTE SYSTEMIC INFECTIONS IN MICE

	PD_{50}mg/kg (calculated on a penicillin, free-acid basis) with 95% Confidence Limits			
	CP-15,464-2		Carbenicillin	Ampicillin
	Oral	S. C.	S. C.	Oral
Escherichia coli	20.5 ± 6.1	22 ± 5.9	21.5 ± 5.9	25 ± 13
Staphylococcus aureus	40 ± 10.7	41 ± 9.8	38 ± 3.1	—
Streptococcus pyogenes	14 ± 4.5	8 ± 2.5	8.7 ± 2.7	—
Proteus species				
P. vulgaris	190		200 ± 61	>400
P. mirabilis	175		185 ± 88	200 ± 80
Pseudomonas aeruginosa				
Strain — JH47	250 ± 135		200 ± 98	>400
A38	290		210 ± 84	>400

gm of silicic acid, and the mixture was swirled intermittently for twenty minutes. After this time the mixture was again filtered and the silicic acid was washed well with small volumes of acetone (total volume circa 35 ml). The combined filtrate and washings were evaporated under reduced pressure to a partially solid residue. The residue was dissolved in 0.25 ml of methanol, and the solution was spotted at three levels (5, 10, 20 lambda) on a thin layer chromatographic (TLC) plate (Eastman Chromagram-Sheet 6060 — Silica Gel with fluorescent indicator) along with three levels of a control. The plate was developed (300 parts acetone: 50 parts of a 0.2*M* aqueous sodium acetate solution), then plated on a *B. subtilis* bioplate for fifteen minutes. The TLC sheets were removed from the agar, and the bioplates were developed overnight at 37 C. From the comparison of the sizes of the zones of inhibition from the sample with those of the known control, an estimate was made of the drug concentration in the sample.

1. The volume of serum used is dependent upon the concentration of drug in the serum. In the range of 10-20 mcg/ml, 1 ml of serum is adequate. In the 5 mcg/ml range or less, 2.0 ml of serum should be used. If 2.0 ml of serum is used, 4 ml of acetone should be added. Also the cake should be washed with a correspondingly greater amount of acetone and 2.0 gm of silicic acid should be added to the filtrate.

2. The transfer during the filtration and subsequent wash of the cake must be quantitative.

3. The silicic acid removes an additional amount of protein.

4. The levels spotted on the TLC plates must be such that a difference in concentration will be readily discernible. If there is too much drug in the spots, all will be very intense, ie, give large zones of inhibition and no reasonable estimate of relative concentration can be made. Hence, the lower level must afford a very weak zone, or no zone.

5. The control is a sample of serum spiked with the drug in question at a level approximating the anticipated serum level.

Table 5

Activity of Carbenicillin Indanyl Sodium Against Urinary Tract Infections in Rats

		Dosage	Log viable organisms/ gram kidney	
		mg/kg	Treated	Inf. Control
Escherichia coli	Carbenicillin Indanyl Sodium	50	1.32	7.63
		25	2.27	7.63
		12.5	3.47	7.63
	Carbenicillin (subcut.)	50	1.52	6.76
	Cephalexin (oral)	50	2.88	8.15
	Cephalo-glycin (oral)	200	6.64	7.35
	Ampicillin (oral)	50	1.37	6.76
Pseudomonas aeruginosa	Carbenicillin Indanyl Sodium	100	2.89	5.72
	Carbenicillin (subcut.)	100	3.57	5.72
	Ampicillin (oral)	100	5.30	5.72
Proteus vulgaris	Carbenicillin Indanyl Sodium	50	3.08	6.57
	Carbenicillin (subcut.)	50	4.42	5.72
	Furadantin (oral)	50	2.35	6.57

This control is worked up in exactly the same manner as the test sample.

6. The bioplate is prepared from Streptomycin assay agar (with yeast extract) prepared according to the standard directions. For one plate (38x48 cm), 300 ml of agar broth seeded with *B. subtilis* was used. Plates were poured on a level surface to insure uniform thickness of the agar layer. This is necessary since the size of the zone of inhibition is a function of the agar thickness.

Results and Discussion

Carbenicillin is a recently introduced semi-synthetic penicillin which has found wide application for the treatment of gram-negative infections. It is, however, a very polar substance and not stable in acidic solutions; at pH 2.0 it has a half-life of less than thirty minutes, and it is readily destroyed by gastric juice. Therefore, this antibiotic is not effective when administered by the oral route. Carbenicillin indanyl sodium was prepared in an attempt to overcome these deficiencies and yet retain the desirable biological properties of carbenicillin. This particular carbenicillin ester was selected from a large number of homologs that had been synthesized based upon considerations of overall performance *in*

TABLE 6

SINGLE DOSE STUDY WITH CARBENICILLIN INDANYL SODIUM IN HUMAN VOLUNTEERS*

		Serum carbenicillin levels (mcg/ml) free acid						Urinary Excretion — % of administered dose			
		Hours after Dose						Hours after Dose			
Drug	Dose	0	½	1	2	3	4	0-3	3-6	6-24	24-
Carbenicillin	250 mg	0	3.3	3.1	2.6	0	0	23.2	16.4	6.5	0
(i.m.)	500 mg	0	15.0	14.5	9.3	4.3	0	20.9	12.0	18.5	0
Carbenicillin	500 mg	0	2.1	4.9	0	0	0	18.3	12.0	3.0	0
Indanyl Sodium	1000 mg	0	8.3	10.2	7.5	3.1	0	13.4	15.8	10.3	0

*These data are the average values obtained for twelve subjects.

vitro and *in vivo* and favorable toxicological properties. The use of an indanyl ester provides chemical stability which prevents acid-catalyzed degradation by gastric juice; it also provides the lipophilic properties necessary for good absorption from the gastrointestinal tract. The temporary role of the phenolic indanol moiety is to aid the oral absorption of the parent drug; it is removed *in vivo* regenerating the active principal (carbenicillin) and metabolic by-products derived from 5-indanol.

In vitro studies. Both carbenicillin indanyl sodium and carbenicillin have relatively broad spectra of activity against gram-positive and gram-negative bacteria. A sample study carried out in these laboratories is shown in Table 1. Further *in vitro* data for carbenicillin and its indanyl ester against a series of gram-negative clinical isolates are displayed in Table 2. In general, the *in vitro* profile of carbenicillin indanyl sodium closely resembles that of carbenicillin and shows good activity against indole positive *Proteus* and *Pseudomonas* species. The enhanced *in vitro* potency of the indanyl ester against certain gram-positive bacteria as compared to carbenicillin is the result of the less acidic properties and the increased lipophilic character of the ester. These physical-chemical properties of penicillins have a profound effect upon the uptake and binding of the antibiotics to the gram-positive bacterial cells. Similar effects were not observed in gram-negative bacteria, probably because of hydrolysis of the ester during the incubation period. It should be noted that the improved gram-positive activity of carbenicillin indanyl sodium is not manifested in *in vivo* situations; the drug is so rapidly metabolized following oral absorption that it produces the same biological response as carbenicillin.

The chemical stability of carbenicillin indanyl sodium is illustrated in Table 3. The percent degradation was obtained from MIC values determined after the antibiotics had been incubated with synthetic gastric juice (pH 2.0) for one hour at 37 C. The indanyl ester of carbenicillin was quite stable, but both carbenicillin and benzyl penicillin were almost totally destroyed under these experimental conditions.

In vivo studies. The indanyl ester of carbenicillin proved to be as effective when administered orally as when given by the subcutaneous route for the treatment of acute experimental infections in mice. (Table 4) The PD_{50} values are expressed in terms of mg/kg of the penicillin salt; those for indanyl carbenicillin (CP-15,464) have not been adjusted to correct for the increased molecular weight resulting from the indanyl moiety. Thus, on a weight for weight basis, the indanyl ester is as active *in vivo* as carbenicillin, even though it contains only 76% by weight

Table 7

Multiple Dose Comparison of Carbenicillin Indanyl Sodium and Ampicillin in Human Volunteers

Antibiotic/ Dosage Regimen	Day of Test	Serum antibiotic levels (mcg/ml)* following first two doses of each day.									
		0	0.5	1	2	3	4	6	6.5	7	8
Ampicillin	1	0.0	0.81	2.22	2.16	0.95	0.45	0.15	0.40	1.55	1.27
500mg	2	0.31	0.32	1.51	2.43	—	—	0.31	0.56	1.11	1.55
every 6	3	0.29	0.34	0.50	0.81	0.40	0.26	0.07	0.05	0.85	1.23
hours	4	0.25	0.33	0.76	0.99		—	0.16	0.14	0.53	0.47
Carbenicillin	1+	0.0	0.00	2.53	0.00	0.0	0.0	0.0	3.18	6.31	4.75
Indanyl			(<0.31)	(<0.31)	(<0.31)			—	(1.0)	(0.2)	
Sodium	2	0.0	6.60	9.14	4.98	—	—	0.0	6.78	6.61	3.72
500mg			(1.0)	(0.2)	(<0.31)				(0.62)	(<0.31)	
every 6	3	0.0	6.16	11.0	6.07	2.09	1.64	0.0	5.19	13.3	8.81
hours			(0.26)	(0.13)	(<0.31)				(0.28)	(0.1)	
	4	0.0	3.02	7.78	8.34	—	—	0.0	7.91	11.5	8.79
			(<0.31)	(<0.31)	(<0.31)				(0.31)	(<0.31)	
Carbenicillin	1+	0.0	3.50	6.13	3.36	3.69	0.0	0.0	5.90	10.8	9.9
Indanyl			(0.2)	(0.2)	(0.62)				(0.73)	(0.52)	
Sodium	2	0.0	5.71	11.9	11.8	—	—	—	4.89	9.81	10.6
1000mg			(0.20)	(<0.62)	(0.83)				(<0.62)	(<0.62)	
every 6	3	1.04	9.44	18.0	11.3	10.9	5.73	0.0	4.18	13.8	15.1
hours			(1.25)	(0.94)	(<0.62)				(<0.62)	(0.52)	
	4	1.86	12.8	17.9	16.1	—	—	0.0	6.52	13.1	16.0
			(1.1)	(0.57)	(0.41)				(0.20)	(<0.62)	

*Values in parentheses and serum levels of carbenicillin indanyl sodium.

+The first dose of these studies was one-half of the presented regimen.

of carbenicillin as the biologically active component. The indanyl ester of carbenicillin had activity comparable with ampicillin when administered by the oral route for treatment of the systemic *E. coli* infections, and the orally administered ester was as effective as parenteral carbenicillin.

Both carbenicillin and its indanyl ester are effective agents for the treatment of experimental infections of the urinary tract in rats. Infections were produced by surgical methods, and the performance of an antibiotic was judged by its ability to reduce the count of viable organisms in the kidneys. In these experimental studies, oral carbenicillin indanyl sodium was compared with parenteral carbenicillin and with other orally effective agents which are commonly used for the treatment of urinary tract infections (ampicillin, cephalexin, cephaloglycin and Furadantin). Results are summarized in Table 5. Carbenicillin indanyl sodium was as effective as ampicillin and better than the other oral agents for the treatment of the *E. coli* infections as indicated by the reduction of the numbers of viable micro-organisms in the infected kidney tissues. Carbenicillin indanyl sodium was clearly superior to ampicillin in the *Pseudomonas* tests and comparable with Furadantin in the *Proteus vulgaris* infection. In all of these experimental urinary tract infections the effectiveness of the oral carbenicillin ester was generally as good as or better than that of parenteral carbenicillin.

TABLE 8

MULTIPLE DOSE COMPARISON OF CARBENICILLIN INDANYL SODIUM AND AMPICILLIN: URINARY ANTIBIOTIC CONCENTRATION IN HUMAN VOLUNTEERS

Anti-	Dosage		Urine Antibiotic levels (mcg/ml) hrs. after commencing study											102
biotic	Regimen	0-3	3-6	6-24	24-27	27-30	30-48	48-51	51-54	54-72	72-75	75-78	78-96	110
Ampicillin	500mg every 6 hours	219.2	164.6	125.8	182.5	171.4	114.0	470.8	58.1	256.5	321.7	225.0	178.7	90
Carbenicillin Indanyl Sodium	500 mg every 6 hours	455.0	67.0	518.4	697.5	117.1	437.8	756.6	355.5	543.3	444.5	387.9	284.4	46
	1000 mg every 6 hours	1162.6	272.3	655.3	602.1	71.3	780.1	818.9	607.6	151.0	599.8	183.6	441.0	47

Pharmacokinetics and Metabolism

Single and multiple dose studies with carbenicillin indanyl sodium were conducted with human volunteers. Serum and urine samples were carefully monitored to establish both the quantity and the identity of the biologically active components. For this purpose, a differential assay was developed to determine indanyl carbenicillin concentrations in the presence of both benzyl penicillin and carbenicillin. The method involved the separation of antibiotics in the mixture by thin layer chromatography and then assaying each biologically active component by a twofold serial dilution method on bioplates (test organism, *B. subtilis*). Results were obtained by an "end-point method" using appropriate control samples of known concentrations or by constructing standard curves from the diameters of the zones of inhibition. The end-point assay seemed to be the more dependable methods.

When assaying serum samples, it was first necessary to remove serum protein prior to the chromatographic separation of biologically active solutes. The procedure involved (i) precipitation of all serum proteins by use of an acetone/silicic acid treatment followed by (ii) evaporation of the filtrate to obtain the antibiotic activity in a concentrated form. [This assay method permitted recovery of better than 85% of carbenicillin indanyl sodium from spiked serum samples. Recovery of carbenicillin was lower (20%), but since the quantity recovered was consistent from experiment to experiment, an accurate quantitation of carbenicillin content was achieved by use of appropriate controls. In practice, the standard cylinder-plate assay was used to determine the carbenicillin concentrations, and the differential assay was used to quantitate the indanyl ester and to corroborate the findings of the plate assay]. The concentrated antibiotic fraction was reconstituted in a small volume of solvent, and known aliquots of this solution were applied to a TLC plate. In theory, it requires only a MIC quantity of antibiotic to produce a zone of inhibition of the bioplates. This assay procedure is laborious but very sensitive and precise. It is possible to quantitate concentrations of indanyl carbenicillin in serum as low as 0.1 mcg/ml and even lower concentrations of benzyl penicillin.

Results of the single dose and multiple dose studies with carbenicillin indanyl sodium are shown in Tables 6, 7, and 8. Blood samples were processed immediately after collection, and serum samples were kept frozen until assayed (within three to four hours after processing). Under these conditions there was essentially no hydrolysis of carbenicillin in-

Table 9

Comparison of Carbenicillin Indanyl Sodium and Ampicillin Peak Serum Levels

		Antibiotic serum levels		Carbenicillin ester serum levels	
Antibiotic	Regimen	Mean Peak Level (mcg/ml)	Time after dose (hours)	Mean Peak level (mcg/ml)	Time after dose
Ampicillin	500mg, q.i.d.	1.41	1.6 hours	—	—
Carbenicillin Indanyl Sodium	500mg, q.i.d.*	9.37	1.14 hours	0.41	0.68 hours
	1000mg, q.i.d.*	14.92	1.14 hours	0.57	0.68 hours

*These values do not include the first dose of each study which were one half of the prescribed regimen.

danyl sodium to produce carbenicillin; thus the antibiotic titer shown in Tables 6 and 7 fairly represent what was present in serum at the time of collection. The single dose study was a comparison of tablets of carbenicillin indanyl sodium and parenteral carbenicillin. The serum antibiotic concentrations provided by parenteral carbenicillin are quite similar to those produced by twice the dosage of the carbenicillin indanyl ester. Again, it must be noted that the dosage regimen represents the weight of *indanyl carbenicillin-free acid* although the antibiotic was administered as the sodium salt and these numbers have not been adjusted to accommodate the differences in molecular weight between carbenicillin and its indanyl ester. Thus a 1000 mg dosage of the ester is equivalent to 764 mg of carbenicillin.

It is of interest to note that the blood levels of carbenicillin following oral dosage of the carbenicillin ester (14 mg/kg) in man compare favorably with those produced by 130 mg/kg in dogs.

The multiple dose study in human volunteers (Table 7) was a comparison of carbenicillin indanyl sodium at 500 mg and at 1000 mg four times a day with ampicillin (500 mg four times a day). The two groups receiving carbenicillin indanyl sodium consisted of six men each; the group on ampicillin had five volunteers. The antibiotics were administered at regular six-hour intervals for four consecutive days, but the serum antibiotic levels were monitored only during the first eight hours of each day. The very first dose of the carbenicillin indanyl sodium regimens was one-half of the prescribed dosage. Good dose-response curves were obtained. Almost all of the active antibiotic in serum was carbenicillin; small amounts of the indanyl ester were present during the first two hours following each dose. Only trace amounts of benzyl penicillin were observed. The concentrations of carbenicillin in urine were very high, and in many subjects exceeded 1000 mcg/ml. The increased dosage from 500 mg four times a day to 1000 mg four times a day for the carbenicillin ester gave a marked increase in carbenicillin content of serum, but a similar change was not observed for the serum ester content. This implies that only a small percentage of the total dose of the carbenicillin ester escaped into the circulatory system.

At the highest dosage regimen (1000 mg four times a day) for the indanyl ester there appeared to be a slight increase in peak levels after the first nine to ten doses. This was not so apparent at the lower dosage regimen (500 mg four times a day), It was also noted that the antibiotic serum titers were prolonged after dosage at night.

Table 9 highlights this essential difference between the multiple dose regimens of these antibiotics.

Summary

Carbenicillin indanyl sodium is a new semisynthetic penicillin. It is an orally effective derivative of carbenicillin. The indanyl carbenicillin is acid-stable and rapidly absorbed from the gastrointestinal tract and is hydrolyzed *in vivo* to produce carbenicillin and metabolic by-products derived from indanol. Orally administered carbenicillin indanyl sodium provides the same therapeutic effect as parenterally administered carbenicillin disodium in experimental infections in mice and rats. The serum and urine levels of carbenicillin produced by a single 1.0 gram oral dose of carbenicillin indanyl sodium in man compare favorably with those following a single intramuscular injection of 1.0 gram of carbenicillin. The urinary concentrations of carbenicillin achieved by a multiple dosage regimen of indanyl carbenicillin sodium (.5 gram four times a day) in man easily exceed the MIC values of common urinary tract pathogens.

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W. I. B. BEVERIDGE (1908-)

There is an interesting saying that no one believes an hypothesis except its originator but everyone believes an experiment except the experimenter. Most people are ready to believe something based on experiment but the experimenter knows the many little things that could have gone wrong in the experiment. For this reason the discoverer of a new fact seldom feels quite so confident of it as do others. On the other hand other people are usually critical of an hypothesis, whereas the originator identifies himself with it and is liable to become devoted to it. It is as well to remember this when criticising someone's suggestion, because you may offend and discourage him if you scorn the idea. A corollary to this observation that an hypothesis is a very personal matter, is that a scientist usually works much better when pursuing his own than that of someone else. It is the originator who gets both the personal satisfaction and most of the credit if his idea is proved correct, even if he does not do the work himself. A man working on an hypothesis which is not his own often abandons it after one or two unsuccessful attempts because he lacks the strong desire to confirm it which is necessary to drive him to give it a thorough trial and think out the possible ways of varying the conditions of the experiment.

The Art of Scientific Investigation, Ch. V

TREATMENT OF URINARY TRACT INFECTIONS WITH OXOLINIC ACID

In Patients with Normal and Impaired Renal Function

• Oxolinic acid was well tolerated in this group of patients with chronic urinary tract infection. This drug was efficient in eradication of susceptible organisms from the urine, but the frequent development of resistance is a major concern.

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Paul O. Madsen, M.D.

Oxolinic acid is being investigated in search for new and more effective agents in the treatment of urinary tract infections. Its structure (Fig. 1) and antibacterial spectrum are very similar to those of nalidixic acid. The minimal inhibitory concentration for common gram-negative organisms found in urinary tract infections, however, is much lower (1/5 to 1/10) than that of nalidixic acid, being about 1-6 mcg/ml.[1,2] We have investigated the efficacy and safety of oxolinic acid in the treatment of chronic urinary tract infections in patients with normal and reduced kidney function.

Materials and Methods

Male patients, practically all with chronic urinary tract infection, were included in the study. Most of the patients had normal renal function; nineteen had reduced renal function. The patients' average age was approximately 70 years. Almost all the urinary tract infections were associated with lower urinary tract disease, such as benign hypertrophy of the prostate, cancer of the prostate, bladder stones, and bladder tumors. Most of the patients with impaired renal function had indwelling catheters. This patient group represents a very chronic and persistent type of urinary tract infection. Most patients had been treated previously with other chemotherapeutic agents or antibiotics, and thus many of the cases represented recurrent or persistent infections. Urine cultures were obtained from midstream urine, and counts higher than 5000 colonies/ml were considered positive although the great majority of the patients had counts higher than 100,000 colonies/ml. The usual dosage of oxolinic acid was 750 mg twice daily. In order to evaluate possible accumulation of oxolinic acid during treatment, determinations of serum concentration of biologically active oxolinic acid were carried out on blood samples obtained two hours following the last oral administration on the first, seventh, fourteenth and twenty-first day of treatment in both patient groups. Determinations of urine concentration of biologically active oxolinic acid were carried out

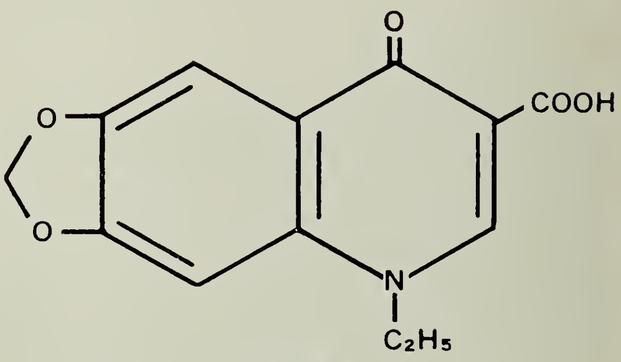

Figure 1.

Oxolinic Acid: 5-ethyl-5, 8-dihydro-8-oxo-1, 3-dioxolo (4,5-g)-quinoline-7-carboxylic acid. Molecular weight: 261.2 Empirical formula: $NO_5C_{13}H_{11}$.

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TABLE 1

Bacteriological response of 98 gram-negative sensitive microorganisms sensitive to oxolinic acid during treatment with oxolinic acid 750 mg q 12 h for 10-15 days. Sensitivity is defined as a zone of 15 mm or more around a 5 μg disc.

Infecting microorganism (sens. to oxolinic acid)	No. of strains	Eradicated during treatment	Persisted during treatment (developed resistance)
E. coli	44	89%	11%
Proteus	30	67%	33%
Klebsiella	24	79%	21%

on 24-hour urine specimens collected on the same treatment days. A two-fold tube dilution technique was used with a sensitive *E. coli* strain as test organism. Sensitivity testing was carried out with various disc concentrations (from 0.5 to 5 mcg). Additional laboratory work-up included complete blood count, SGOT, and alkaline phosphatases done before and at the end of treatment.

Results

The bacteriological and clinical response of the treatment is illustrated in Tables 1-3. The results of the bioassays are illustrated in Figures 2 and 3 and listed in detail in Table 3. The serum concentrations of oxolinic acid obtained at intervals from one to twelve hours following the administration of 750 mg twice daily in eight patients with normal renal function reached peak levels after two hours, averaging 0.9 mcg/ml on the first day of treatment, 1.9 mcg/ml on the seventh and 2.1 mcg/ml on the fourteenth day of treatment. These very low serum concentrations indicate that oxolinic acid should not be used in the treatment of systemic infections where high serum and tissue concentrations are desirable, but should be used only in urinary tract infections, similar to the use of nalidixic acid and nitrofurantoin.

The serum concentrations following administration of 750 mg twice daily of oxolinic acid to 19 patients with impaired renal function were only slightly higher than those in patients with normal renal function (Figure 3). Neither group shows a tendency to accumulation of biologically active substance in the serum over a treatment period of 21 days. The mean 24-hour urine concentration in eight patients with normal renal function averaged from 44 to 96 mcg/ml, a concentration which must be considered therapeutically adequate since it is many times higher than the minimal inhibitory concentration for most common infecting organisms in the urinary tract. Also in the patients with impaired renal function even the first day average urine concentrations were high (Table 3), which demonstrates that the bacteriological response in these azotemic patients was as good as in patients with normal renal function. The total amount of recovered oxolinic acid in the 24-hour urine of patients with normal renal function averaged

Time of evaluation	Results Neg. culture	 Reinfection	 Persistence
Last day of treatment (93 patients)	47%	29%	24%
1-6 Weeks following treatment (83 patients)	41%	59%	

TABLE 2

Bacteriological response in 93 patients infected with one or more organisms sensitive to oxolinic acid and treated with oxolinic acid 750 mg q 12 h for 10-15 days. Colony counts less than 5,000 colonies/ml are considered negative.

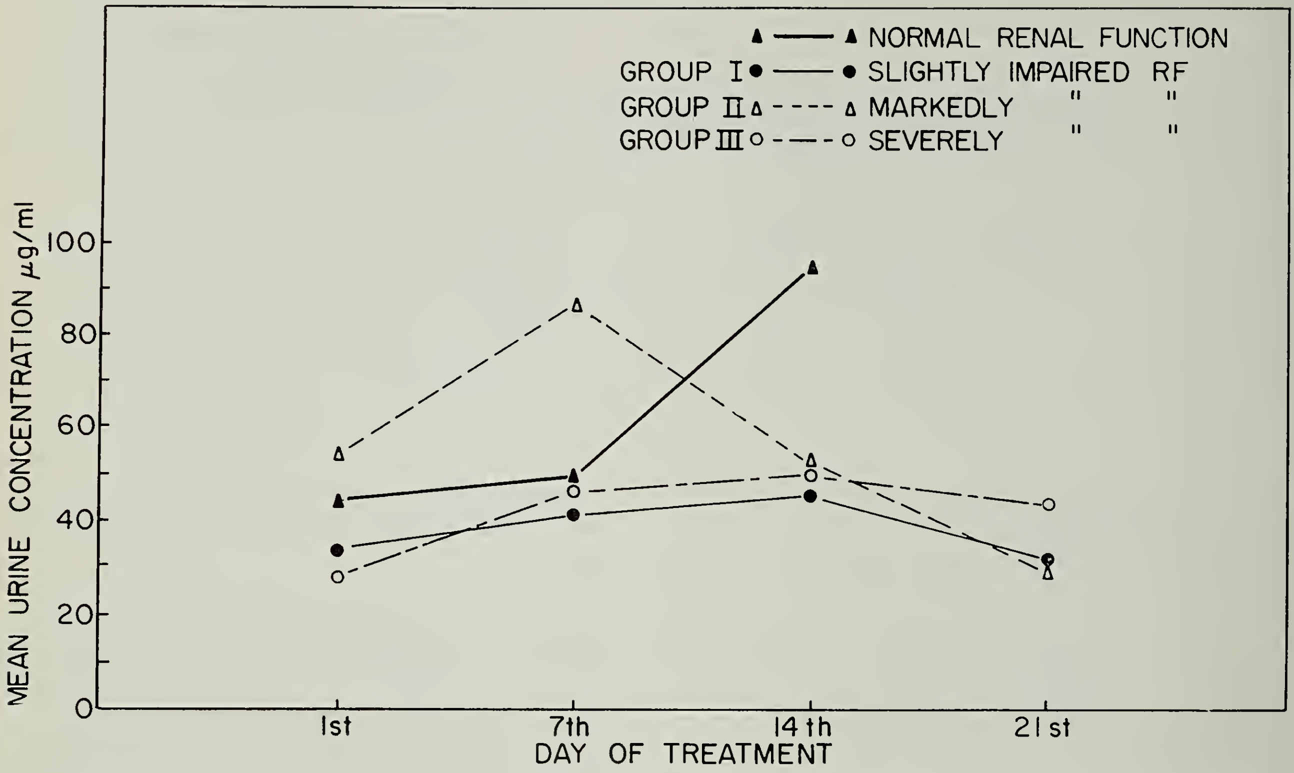

Figure 2. Mean urine concentrations (μg/ml) during 14-21 days of treatment with oxolinic acid 750 mg every 12 hours in patients with normal renal function and with varying degrees of impairment of renal function. There is a sufficiently high urine concentration of oxolinic acid for therapeutical purposes in all four groups of patients.
For definition of renal function impairment see Table 3.

6.5 per cent, ranging from 1.8-21.2 per cent. In patients with impaired renal function, the average excretion was also 6.5 per cent, ranging from 0.9-42 per cent. It therefore appears that even patients with poor renal function do not need an initial loading dose in order to achieve immediate and effective urine concentrations.

In the patients with normal kidney function 79 per cent of the organisms found sensitive by the disc sensitivity method were eradicated during the treatment, whereas two per cent persisted despite sensitivity according to the disc sensitivity test and 19 per cent developed resistance during the treatment. In patients with impaired renal function, eleven organisms were sensitive *in vitro* and nine of the eleven were eliminated during therapy. Resistance as a rule had developed within one to three days of treatment. This frequent development of resistance has also been found following the administration of nalidixic acid.[1]

In a comparative randomized study of 60 patients with gram-negative urinary tract infections where 30 patients were treated with nalidixic acid, 1 gm four times daily, and 30 patients with oxolinic acid, 1 gm twice daily, for 14 days, the bacteriological results of the two groups were not significantly different. In both groups a negative urine culture, which remained negative for one to two weeks following the treatment, was accomplished in 40 per cent of the patients.

The most common side effects of therapy were nausea, vertigo, insomnia and drowsiness. There was no overall evidence of a toxic effect on the renal function in the normal or in the azotemic patients. Other laboratory tests conducted before and after treatment indicated no toxic effect on liver function and hematopoietic function. The number of side effects previously mentioned was not significantly

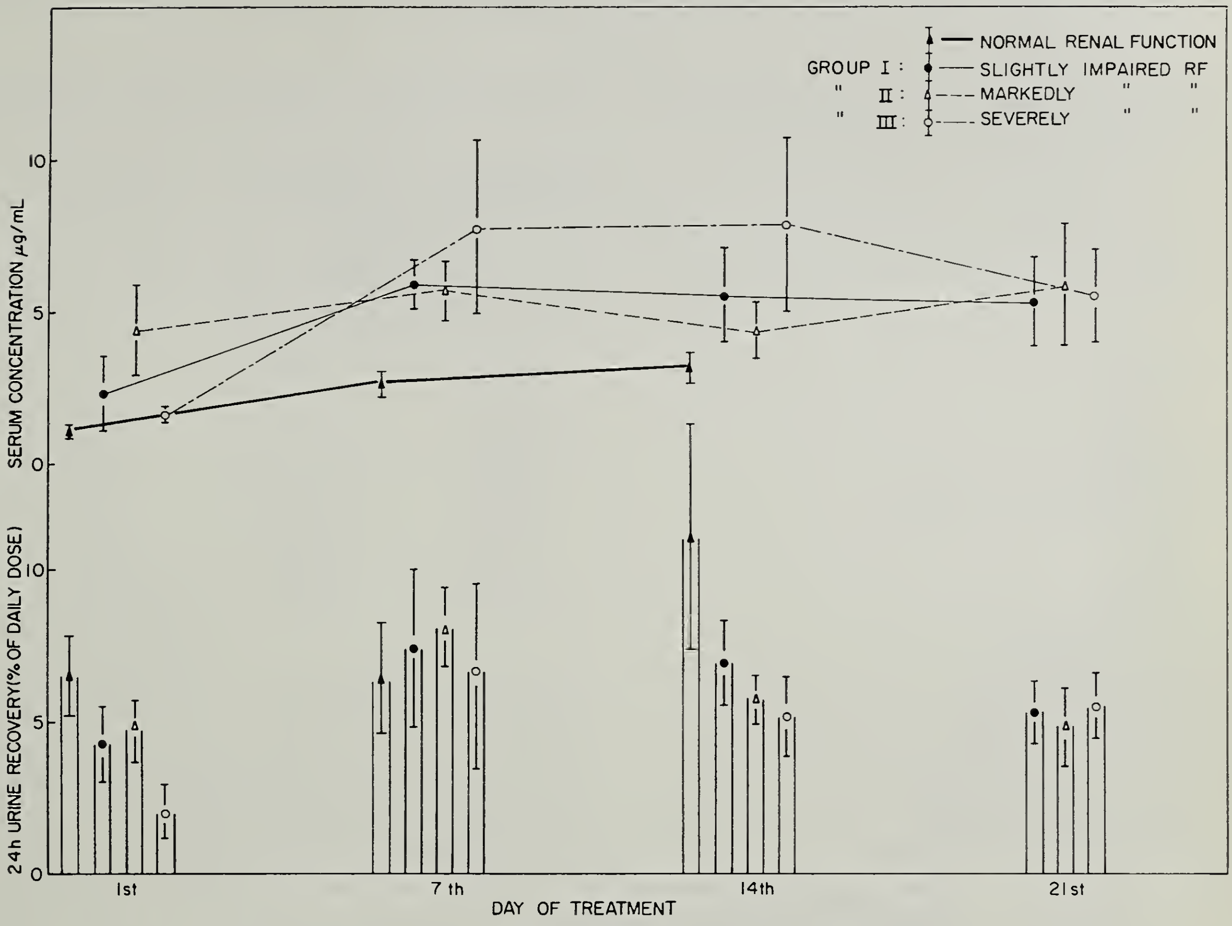

Figure 3. Mean serum concentrations (µg/ml ± 1 standard error) of oxolinic acid and recovery rate of oxolinic acid over a 24-hour period in patients with normal and varying degrees of impairment of renal function. There is no significant difference in the serum values of biologically active substance on the various days of determination, and there is no significant difference in the 24-hour urine recovery of biologically active substance in the four groups of patients.
For definition of renal function impairment see Table 3.

different from that found in patients with normal renal function.[3]

Discussion

The effect of oxolinic acid has been found very similar to that of nalidixic acid. The advantage of oxolinic acid over nalidixic acid would be in the somewhat more prolonged effect of the oxolinic acid since adequate urine concentrations are found up to 12 hours following a single dose. Since we found no difference in the efficacy of the various dosages of oxolinic acid tested, we recommend a dosage of 750 mg twice daily. Patients should only be treated if disc sensitivity indicates that the microorganism is sensitive. If the treatment has not resulted in a negative urine within 48 to 72 hours, the treatment can probably be considered a failure since the infecting organism has by then developed resistance to the oxolinic acid.

The possibility that biologically inactive metabolic products of oxolinic acid, most likely inactivated as the glucuronide,[3,4] can accumulate and be toxic to patients with impaired renal function can be excluded by our study.

Summary

A new chemotherapeutic agent, oxolinic acid, was tested in the treatment of chronic urinary tract infections in patients with nor-

TABLE 3

Mean urine concentration (mcg/ml) and bacteriological response during 21 days of treatment with oxolinic acid, 750 mg q 12 h.

		Group I	Group II	Group III
No. of Patients		8	7	4
	[a]BUN	25.9 ± 9.96	30.4 ± 6.95	64.5 ± 7.14
Day of treatment	[b]S.C.	1.65 ± 0.29	2.3 ± 0.23	4.4 ± 1.12
	[c]C.C.	53.4 ± 12.5	31.7 ± 5.40	16 ± 2.94
1st		34.1	54.5	28
(range)		8.7-64	14-155.6	18-34
7th		42.2	87.8	46.0
(range)		11.4-155.5	14.8-155.6	2-97.9
14th		46.4	53.4	50.5
(range)		18.2-102	16.7-113.6	16-70
21st		32.4	31.3	44.1
(range)		19.3-46.2	13.6-64	19-71.4
No. of sensitive organisms		5	4	2
No. eradicated during treatment		4	4	2

[a] Blood Urea Nitrogen (Mean ± 1 standard deviation)
[b] Serum Creatinine (Mean ± 1 standard deviation)
[c] Creatinine Clearance (Mean ± 1 standard deviation)

Group I: Slightly impaired renal function
Group II: Markedly impaired renal function
Group III: Severely impaired renal function

mal and impaired renal function. The drug was well tolerated in both groups. Oral administration of 750 mg twice daily resulted in sufficiently high urine concentrations in both groups. The drug was found to be safe and efficient and showed no accumulation in the blood, but produced high urine concentrations even in patients with poor renal function. In patients with normal renal function it eliminated from the urine 79 per cent of gram-negative microorganisms sensitive to oxolinic acid and cured 41 per cent of the infections. In patients with impaired renal function, nine of eleven sensitive microorganisms were eradicated during treatment. The high incidence of reinfection in this group was mainly due to resistant enterococci. The low serum concentrations and high urine concentrations limit the usefulness of this drug to urinary tract infections due to susceptible gram-negative organisms. The frequent development of resistance is a major concern.

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> Never forget that it is not a pneumonia, but a pneumonic man who is your patient. Not a typhoid fever, but a typhoid man.
>
> Sir William Withey Gull (1816-1890) *Published Writings* (ed. by T. D. Acland), Memoir II.

CLINICAL EXPERIENCE WITH ORAL CARBENICILLIN

• The oral formulation of carbenicillin appears to be an effective agent in the treatment of acute and chronic urinary tract infections. When available for general use this preparation may be valuable in the treatment of selected patients.

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William J. Holloway, M.D.

Carbenicillin, a semi-synthetic penicillin, has a wide spectrum of activity against gram-negative and gram-positive bacteria.[1] Particularly significant to the clinician is the bactericidal effect of this new antibiotic against strains of *Pseudomonas aeruginosa* and *Proteus* species. The parenteral formulation of carbenicillin has now been used extensively in the treatment of patients with infections due to gram-negative bacilli.[2-4] The current formulation of carbenicillin can not be given by the oral route because it is rapidly inactivated by gastric acid. Recently, an indanyl ester of carbenicillin has been made available which is well absorbed when given by the oral route and has essentially the same antibacterial activity as the parent compound.[5] This ester is metabolized into carbenicillin upon absorption into the blood stream and is excreted into the urinary tract as carbenicillin. Preliminary studies carried out in our laboratory indicate that the blood level of carbenicillin following oral dosing with 500 mg of the indanyl ester is extremely variable ranging from less than 2 mcg/ml to 4.5 mcg/ml. In the same volunteers, urinary levels of carbenicillin following this dose of the indanyl ester are more consistent, ranging from 400 to 500 mcg/ml in aliquots of urine collected two to three hours after dosing. The broad antibacterial spectrum of carbenicillin and its indanyl ester, coupled with the consistent urinary levels of antibiotic obtained after oral administration, prompted a clinical trial of this formulation in the treatment of patients with acute and chronic urinary tract infection.

Material and Methods

Sixty-three patients were selected for inclusion in this study. These patients were from the Medical and Surgical Services of the Wilmington Medical Center, the Pyelonephritis Clinic of the Wilmington Medical Center and private outpatients at the Brandywine Medical Center. Of the total of sixty-three patients treated, forty-six were females and seventeen males. They were classified as follows: 18 patients, acute cystitis; 3 patients, chronic cystitis; 13 patients, acute pyelonephritis; and 29 patients, chronic pyelonephritis. This clinical categorization of patients was based upon history, symptomatology (fever, loin pain, rigor, dysuria, frequency), the results of laboratory evaluation and in some instances intravenous pyelogram.

Urine cultures were obtained by clean-caught midstream technique or by urethral catheterization. Occasional cultures were obtained by suprapubic bladder aspiration technique. Standard microbiologic techniques were used with a 0.01 ml wire loop; a colony

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count greater than 10^5 was considered evidence of significant infection. Speciation of the organisms was carried out by the standard techniques. Susceptibility of pathogens isolated was determined using a disc-agar diffusion technique with 100 mcg discs of carbenicillin.

The indanyl ester of carbenicillin was supplied as a tablet containing 500 mg by the research laboratories of Pfizer Company. The usual dose schedule was 500 mg of oral carbenicillin every six hours for a minimum period of ten days to two weeks. Modification of this treatment program was necessary in a few patients in whom long-term suppressive therapy with carbenicillin was necessary to maintain a sterile urine. In addition, in a few instances, the dose of carbenicillin was increased to 1000 mg or 1500 mg every six hours in an attempt to sterilize the urine in patients with chronic bacteriuria.

Repeat urine cultures were obtained during therapy and following therapy in all instances for at least a minimum of six weeks.

Pre- and post-treatment toxicity studies included hemogram, chemistry 12 profile and urinalysis. Carbenicillin serum and urine levels were obtained at representative intervals in a large number of the patients in this study.

Results

Forty-two of the sixty-three patients in this study experienced a satisfactory result from therapy while there were eighteen failures and three patients categorized as qualified successes. The overwhelming majority of the failures occurred in patients with chronic pyelonephritis.

Cystitis: Seventeen of the eighteen patients with acute cystitis were treated with a successful outcome. The one patient with acute cystitis who failed to respond to carbenicillin therapy had a persistent infection with *Escherichia coli* with no change in the antibiotic susceptibility pattern of this organism following therapy. Included in the seventeen successful outcomes were eleven patients infected with *Escherichia coli* and one whose infection was due to *Pseudomonas aeruginosa.*

All three patients with chronic cystitis due to *Escherichia coli* experienced a successful result with treatment with oral carbenicillin.

Pyelonephritis: Thirteen patients in this study were categorized as having acute pyelonephritis, and all thirteen of these patients responded to a course of oral carbenicillin therapy. The pathogen in each of these thirteen cases was as follows: *Escherichia coli* = six patients; *Proteus mirabilis* = three patients; beta-hemolytic streptococcus = two patients; and enterococcus = two patients.

Twenty-nine patients with chronic pyelonephritis were included in this study with the majority of these patients having obstructive uropathy and abnormal intravenous urograms. In nine instances, patients with chronic pyelonephritis had an unqualified successful outcome resulting from a course of oral carbenicillin therapy ranging from two to four weeks. Three patients with chronic pyelonephritis were considered as having qualified successful outcomes from the oral carbenicillin therapy. These patients have been classified as having qualified successes because on long-term suppressive therapy with carbenicillin in a dosage of 1 gm four times a day, they have been kept free of bacteriuria and had no clinical relapses. Two of these three patients with chronic *Pseudomonas* pyelonephritis have failed to respond to therapy with any other antibiotic regimen in the past.

Seventeen of the twenty-nine patients in the chronic pyelonephritis group failed to respond to therapy with oral carbenicillin and are detailed as follows: five of eight patients with chronic *Escherichia coli* pyelonephritis failed to respond to oral carbenicillin therapy. In two of these five patients who failed to respond, the *Escherichia coli* isolated on the original urine culture was resistant to carbenicillin. Two additional patients who had a susceptible strain of *Escherichia coli* at the onset of treatment with carbenicillin acquired resistant strains of *Klebsiella* species. The fifth patient with *Escherichia coli* infection who failed to respond maintained a susceptible strain of *Escherichia coli* in his urine. However, there was no clinical or bacteriologic improvement.

In one patient of three who had chronic *Proteus mirabilis,* the organism was replaced with a resistant strain of *Pseudomonas aeruginosa.* One patient with chronic pyelonephritis due to an *Enterobacter* species failed to respond to therapy even though the original infecting organism was sensitive to carbenicillin; it was replaced with a carbenicillin resistant *Enterobacter.* Two of three patients with mixed infections causing chronic pyelonephritis failed to respond to therapy with carbenicillin, in each instance the susceptible pathogens being replaced with resistant *Klebsiella.*

Eight patients with chronic *Pseudomonas* pyelonephritis failed to respond to therapy with oral carbenicillin. In four of these cases, the original susceptible *Pseudomonas* was eradicated but replaced with resistant organisms (*Escherichia coli* in two instances and *Klebsiella* species in two instances). In two patients, urine culture revealed a *Pseudomonas aeruginosa* still sensitive to carbenicillin with the same pyocine typing as the organism isolated prior to therapy. In two additional failures the *Pseudomonas aeruginosa* had been susceptible to carbenicillin prior to therapy, but became resistant during the course of therapy although the pyocine type again remained the same.

Side Effects

There were a minimal number of side effects during therapy in the sixty-three patients in this study. Gastrointestinal distress (nausea and dyspepsia) occurred in five subjects but required termination of therapy in only one instance. One patient was seen who experienced transient dermatographia while receiving oral carbenicillin, and it was thought that this was probably causally related to the antibiotic therapy. There were four instances in which mild hematologic abnormalities were noted during the course of therapy. In two patients, there was mild leukopenia (total white blood count of less than 4,000), and in the other two patients there was an eosinophilia of greater than 10%. In all four instances of hematologic abnormality oral carbenicillin therapy was continued, and the abnormal value reverted to normal.

Antibiotic Levels

Serum specimens were obtained from patients on multiple doses of oral carbenicillin at two, three and four hours following ingestion of a 500 mg dose with considerable variation in the measured levels of carbenicillin. The sensitivity of the technique used did not measure levels below 2 mcg/ml, and in more than 50% of the patients tested, the levels at two-, three-, and four-hour intervals fell below this level. In the remaining fourteen patients, the levels ranged from 2 to 5 mcg/ml. In a representative number of cases, the dosage of carbenicillin was increased to 1 and 1.5 gm of carbenicillin taken at six-hour intervals. Slightly higher serum levels of carbenicillin occurred in these patients on increased dosage with the serum carbenicillin level ranging from 3 to 6 mcg/ml two hours following the 1 gm dose of oral carbenicillin and ranging from 5 to 8 mcg/ml one hour following a 1.5 gm oral dose of carbenicillin.

Likewise, the urine levels in these patients showed considerable variation. Random urine levels obtained in patients attending pyelonephritis clinic (usually three to four hours following a dose of carbenicillin) gave levels ranging from 200 mcg/ml to 1600 mcg/ml. The mean carbenicillin levels for eighteen patients receiving 500 mg orally every six hours was 575 mg/ml.

Summary

The indanyl ester of carbenicillin administered by the oral route appears to be a well-tolerated, effective agent in the treatment of acute urinary tract infections. Further investigation will be necessary to determine the proper role of this antibiotic in the treatment of patients with chronic pyelonephritis. In our experience, there are selected patients with chronic *Pseudomonas* urinary tract infection in which the indanyl ester of carbenicillin appears to be the oral antibiotic of choice.

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CEPHAPIRIN: Clinical, Pharmacological, and Microbiological Studies

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Cephapirin [sodium 7-(pyrid-4-yl-thio acetamido) cephalosporanate] is a new semisynthetic derivative of 7- aminocephalosporonic acid which appears to have an antibacterial spectrum similar to cephalothin and cephaloridine.[1-2] Cephapirin is not significantly absorbed by the oral route and requires parenteral injection.[3] It seems to cause less pain and, after intravenous or intramuscular administration, is better tolerated than cephalothin; unlike cephaloridine it does not appear to be nephrotoxic. Because of these advantages, further study of the drug seemed to be indicated.

The present study was undertaken to determine the following: (1) *in vitro* susceptibility of clinical isolates of gram-positive cocci and gram-negative bacilli to cephapirin, (2) the serum half-life of cephapirin after a 1 gm intravenous dose in persons with normal renal function, and (3) the efficacy and safety of cephapirin in patients with infections due to susceptible organisms.

Materials and Methods

Cephapirin sodium (BL-P1322) was supplied as a sterile powder in vials containing 0.5 or 1.0 gm for intramuscular or intravenous use. Cephapirin in powder form (Lot # 70 F241 - Potency 975 μg/mg) was supplied for use in the tests of bacterial susceptibility.

Two hundred ninety strains of gram-negative bacilli and gram-positive cocci isolated from patients at the Cleveland Clinic during March 1971 were studied. Organisms were identified according to routine bacteriologic methods.[4] These included 64 strains of *Proteus mirabilis*, 48 of *Klebsiella*, 31 of *E. coli*, 20 of *Enterobacter*, 19 of *Pseudomonas aeruginosa*, 36 of *Staphylococcus aureus*, 30 of *Staphylococcus epidermidis*, 30 of Enterococcus group, 7 of alpha hemolytic streptococci, 11 of group A beta hemolytic streptococci, and 3 of *Diplococcus pneumoniae*.

The minimum inhibitory concentration (MIC) of cephapirin for 182 strains of gram-negative bacilli and 96 strains of gram-positive cocci was determined by a microdilution technique.[5] Transparent plastic wells containing the antibiotic in concentrations ranging from 0.2 to 200 μg/ml in brain-heart infusion broth (BBL) were inoculated with 0.05 ml of a 1:1000 dilution of an overnight broth culture. The final concentration of cephapirin ranged from 0.1 to 100 μg/ml. The minimum inhibitory concentration (MIC) was read as the lowest concentration of cephapirin which produced complete inhibition of growth after overnight incubation at 35 C.

The MIC of cephapirin for 11 strains of group A beta hemolytic streptococci, 7 strains of alpha hemolytic streptococci, and 3 strains of *Diplococcus pneumoniae* was determined by a twofold macrodilution method because end point determinations by the microdilution method were difficult with those organisms. The same cephapirin dilution schedule, innoculum ratio, and end point evaluation were used with both methods. Susceptibility of the 290 bacterial isolates was also determined by the agar disc diffusion method using a 30 μg cephapirin disc according to the standardized technique of Bauer and associates.[6]

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Organisms	Number of Strains	BHIB* (μg/ml)	N.B.** (μg/ml)	TSB‡ with dextrose (μg/ml)	TSB‡ without dextrose (μg/ml)
Klebsiella	10	22	15	12	21
E. coli					
Proteus Mirabilis	10	24	10	24	16
Proteus mirabilis	15	18	2.1	16	36

*Brain-heart infusion broth (B.B.L.).
**Nutrient broth (B.B.L.).
‡Trypticase soy broth (B.B.L.).

TABLE 1

Geometric Mean M I C of Cephapirin with Different Broth Culture Media

In order to determine the influence of different culture media on the MIC of cephapirin, 10 strains of *Klebsiella, 10* of *E. coli,* and 15 of *Proteus mirabilis* were tested simultaneously by the microdilution method employing four different broth media. Overnight cultures and serial dilutions of cephapirin were prepared in brain-heart infusion broth (BBL), nutrient broth (BBL), Trypticase soy broth with dextrose (BBL), and Trypticase soy broth without dextrose (BBL). The MIC's were read as described after 18-hour incubation at 35 C. The geometric mean MIC for those strains was determined for each of the four media. The paired T test was applied to evaluate the significance of any observed differences.

Seven adult volunteers with normal renal function (endogenous creatinine clearances > 80 ml/min/1.73 m^2 body surface area) were selected for study after informed consent was obtained. A 1 gm dose of cephapirin diluted in 25 to 50 ml of normal saline was administered intravenously to each person during a period ranging from 2 to 12 minutes. Venous blood was drawn prior to the infusion and at intervals of 15 min., ½, 1, 2, 3 and 6 hours after the infusion. The venous blood was allowed to clot, and serum was collected, frozen, and shipped promptly to the Bristol Laboratories, Syracuse, New York. Assays of the concentration of cephapirin in the serum were performed promptly in the Bristol Laboratories by an agar-plate bioassay method using *Sarcina lutea* ATC 9341 as the test organism.

Values of serum concentration versus time plotted on a semilogarithmic graph showed a linear decline of cephapirin beginning 15 minutes after the intravenous injection. Linear regression lines were calculated by the method of least squares; the slope of each line was used to calculate the serum half-life of cephapirin.

Twenty-nine patients hospitalized in the Cleveland Clinic Hospital from June 1970 to March 1971 were treated with cephapirin for a variety of infections. Informed consent was obtained from each patient or from his responsible relatives. There were 17 males and 12 females, whose ages ranged from 17 to 76 years. Except in one instance, no other antibiotics were given simultaneously. The criterion for selection for treatment with cephapirin was the presence of an infection presumed or proved to be due to an organism susceptible to this drug. Ten of the twenty-nine patients had histories of allergy to the penicillins.

Cephapirin was given intramuscularly or intravenously in individual doses ranging from 0.5 to 2.0 gm at intervals of every 4 to 12 hours. In patients with severely impaired renal function, the drug was usually given at intervals of 8 to 12 hours. The duration of cephapirin therapy ranged from 3 to 48 days

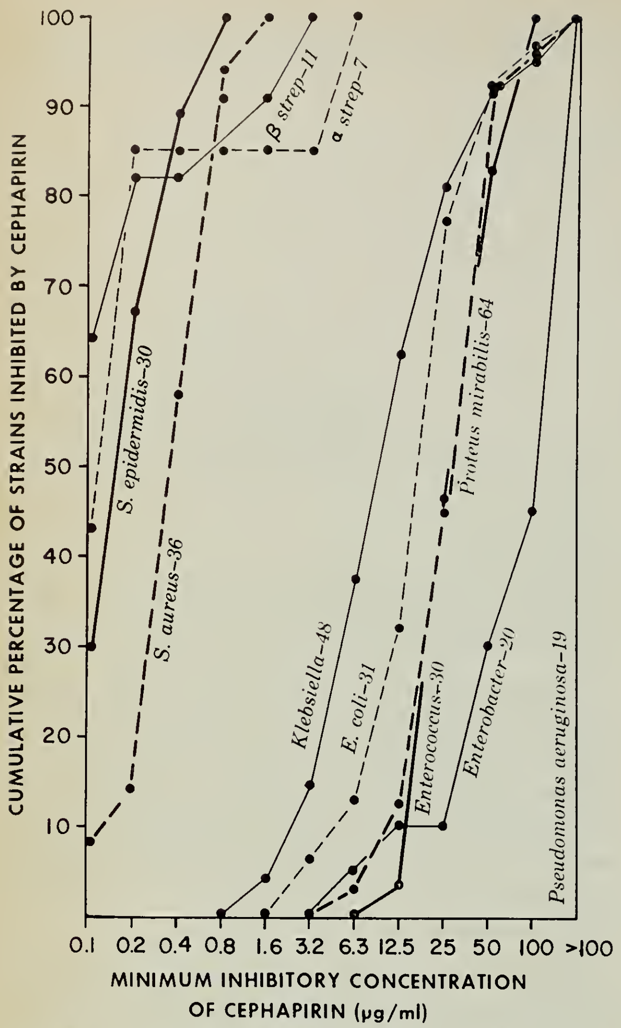

Figure 1: Graphic representation of the cumulative percentage of the various isolates susceptible to increasing concentrations of cephapirin.

and averaged 16.1 days for the entire group. The total dosage of cephapirin ranged from 6 to 516 gm with an average of 113.9 gm for the entire group.

We examined each of the 29 patients daily. Appropriate measures to control underlying diseases and to treat any complications were employed as indicated. Cultures of sites of infection were obtained before, during, and after therapy. The susceptibility of all pathogens was determined by the agar-disc diffusion method or the microdilution method, or both. Laboratory studies including complete blood cell counts, urinalysis, and determinations of serum glutamic oxaloacetic transaminase, lactic dehydrogenase, bilirubin, alkaline phosphatase, blood urea nitrogen, and serum creatinine were carried out before, during, and after therapy.

The results of treatment with cephapirin were classified in four categories: (1) Successful—disappearance of all signs and symptoms of acute infection with sterile cultures during and after therapy. (2) Qualified success—disappearance of all signs and symptoms of acute infection, except for one of the following conditions: cultures of the urine or sputum or other extravascular sites of infection continued to be positive during therapy; bacteriologic or clinical relapse occurred after discontinuation of therapy; or post-treatment cultures were not obtained for various reasons.

Table 2

Serum Levels of Cephapirin in 7 Subjects with Normal Renal Function*

SUBJECT	TIME AFTER 1 GRAM I.V. DOSE OF CEPHAPIRIN SODIUM, HOURS							SERUM HALF-LIFE HRS.
	0.25	0.5	1	2	3	4	6	
#1	50	22	12	3.5	2	—	0.3	0.83
#2	37	14	4.4	1.3	0.5	—	<0.1	0.47
#3	20	8.3	2.8	0.8	0.2	—	<0.1	0.44
#4	46	26	12	4.6	3.2	—	0.6	0.97
#5	34	14	5.6	—	0.8	0.4	<0.1	0.62
#6	48	20	9.3	2.4	0.5	—	<0.1	0.44
#7	22	10	3.3	2.8	0.4	0.2	<0.1	0.54
				MEAN				0.615 ± 0.2 S.D.

*Endogenous creatinine clearance >80 ml/min/1.73m^2 body surface area.

TABLE 3

RESULTS OF CEPHAPIRIN THERAPY IN 10 PATIENTS WITH 12 EPISODES OF NONBACTEREMIC URINARY TRACT INFECTIONS

Infection	Causative Organism(s) (M I C of cephapirin, μg/ml)	Results of Therapy
Acute pyelonephritis	*E. coli* (12.5)	Successful
	E. coli (>100)	Successful
	Proteus mirabilis (50)	Successful
	Klebsiella sp (50) +	Qualified success (relapse after Rx)
	E. coli (100)	Qualified success (relapse after Rx)
	*E. coli**	Qualified success (persistence of bacteriuria despite symptomatic improvement)
	*E. coli**	Unsuccessful (Pseudomonas superinfection)
	E. coli and *Klebsiella sp*	Unsuccessful (Pseudomonas superinfection)
Acute cystitis	*E. coli and Proteus mirabilis* (25)	Qualified success (relapse after Rx)
	Proteus morgani (25)	Indeterminate
Chronic pyelonephritis	*Proteus mirabilis* (25)	Indeterminate
	Klebsiella sp (>100)**	Indeterminate

*Two episodes in this patient.

**Two episodes in this patient.

(3) Unsuccessful—failure to eradicate acute infection or development of significant superinfection. (4) Indeterminate — intervening antibiotic therapy prevented evaluation of effects of cephapirin therapy.

Results

The cumulative percentage of the various isolates susceptible to increasing concentrations of cephapirin is shown in Figure 1. One hundred percent of gram-positive cocci, except enterococci, were inhibited by 6.3 μg/ml or less of cephapirin. Gram-negative bacilli and enterococci showed less susceptibility to the drug.

Differences in the geometric mean MIC's of cephapirin for strains of *E. coli, Klebsiella* and *Proteus mirabilis* tested in different broth media by the microdilution method are shown in Table 1. The geometric mean MIC of cephapirin in nutrient broth was significantly lower for *E. coli* ($p<0.01$) and *Proteus mirabilis* ($p<0.001$) than when those strains were tested in other media.

Pertinent data from each of the seven subjects studied after a single intravenous dose of 1.0 gm of cephapirin are listed in Table 2. Peak serum concentrations of cephapirin were present 15 minutes after the injection and averaged 36.7 μg/ml for the group. Cephapirin concentrations declined rapidly to negligible levels at six hours. The serum half-life of cephapirin ranged from 0.4 to 0.8 hr. with a mean of about 0.6 hr. Our preliminary unpublished data indicate that the serum half-life of cephapirin was somewhat prolonged in patients with severely impaired renal function.

Ten patients with 12 episodes of urinary tract infection were treated. (Table 3) Five

Table 4

Results of Cephapirin Therapy In 8 Patients with Acute Respiratory Infections

Infection	Causative Organisms(s) (M I C of cephapirin, μg/ml)	Result of Treatment
Lung abscess	*Klebsiella sp* (1.6) and *Proteus mirabilis* (12.5)	Successful
Pneumonia	*Klebsiella sp* (6.3)	Unsuccessful
	Klebsiella sp (1.6)	Successful*
	Klebsiella sp (1.6) and *Enterobacter sp* (12.5)	Indeterminate (intervening gentamicin therapy)
	Proteus mirabilis (12.5)	Successful
	Staphylococcus aureus (0.8)	Unsuccessful
Acute purulent bronchitis	*Diplococcus pneumoniae* (sensitive by disc method)	Successful
	Staphylococcus aureus (0.4)	Successful

*Pneumonia cleared before therapy had to be stopped because of bullous erythema multiforme; the latter condition was successfully treated with adrenal glucocorticoids.

of those patients had renal transplants, five had impaired renal function, one had a neurogenic bladder. *E. coli, Klebsiella* or *Proteus* were the causative organisms. The MIC of cephapirin for the various pathogens was determined in nine instances and ranged from 12.5 to more than 100 μg/ml. In three patients, long-term oral antibacterial therapy was started before post-treatment urine cultures were obtained; although the urine cultures were sterile during cephapirin therapy, the results of treatment were classified as indeterminate. Treatment was unsuccessful in only two patients; both had severely malfunctioning renal transplants which later required nephrectomy.

Eight patients received cephapirin therapy for severe respiratory infections—pneumonia, lung abscess, or acute purulent bronchitis caused by various gram-positive cocci or gram-negative bacilli. (Table 4) Isolates were tested by the microdilution method in seven of the eight patients—all of the strains tested had an MIC of 12.5 μg/ml or less of cephapirin. Treatment was clearly unsuccessful in only two patients. One of the two patients had failed to respond to other antibacterial drugs and was in the late stages of necrotizing aspiration pneumonia when cephapirin treatment was begun. The other patient had a renal transplant, intensive immunosuppressive therapy, and fulminating staphylococcal pneumonia which failed to respond to other antibiotics after cephapirin treatment was discontinued.

The results of cephapirin therapy of bacteremic infections are shown in Table 5. Three patients with uncomplicated bacteremia and four patients with bacterial endocarditis were treated. Of the three patients with uncomplicated bacteremia, therapy was successful in two and a qualified success in one. In the latter patient, staphylococcal bacteremia cleared during therapy, but the underlying liver abscess persisted. Of the four patients with bacterial endocarditis, one with a resistant strain of *E. coli* had persistent bacteremia despite cephapirin therapy; bloodstream infection was controlled by another drug. One patient received other antibiotics for more than one day prior to cephapirin; another received an alternative antibiotic when cephapirin had to be discontinued because of drug fever; results of cephapirin therapy in those two patients with

Table 5

Results of Cephapirin Therapy of Bacteremic Infections in 7 Patients

Infection	Causative Organism (MIC of cephapirin, μg/ml)	Result of Treatment
Bacteremia	*E. coli* (12.5)	Successful
	Staphylococcus aureus (0.8)	Qualified success
	Klebsiella sp (12.5)	Successful
Bacterial endocarditis	*Staphylococcus aureus* (0.1)	
	Staphylococcus epidermitis (0.1)	Indeterminate
	Corynebacterium pyogenes (0.1)	Indeterminate
	E. coli (50)	Unsuccessful

endocarditis were classified as indeterminate. The fourth patient had staphylococcal endocarditis, which was cured after 43 days of intravenous cephapirin therapy.

In four patients, miscellaneous infections, including wound infections, chronic draining osteomyelitis, and staphylococcal pyoarthrosis, (Table 6), responded favorably to cephapirin and appropriate surgical drainage.

The overall clinical results in 31 episodes of infection were as follows: successful, 11; a qualified success, 9; unsuccessful, 5; and indeterminate, 6. If the categories of successful and qualified success are combined, and if the indeterminate cases are excluded, the overall rate of success of cephapirin therapy was 80 percent (20/25) and the failure rate was 20 percent (5/25).

The number and types of adverse reactions to cephapirin are listed in Table 7. Side effects occurred in about one-third of our patients. In general, they were mild and of no clinical significance. However, in three patients, severe side effects necessitated termination of cephapirin therapy; those included bullous erythema multiforme, drug fever with transient leukopenia, and generalized maculopapular rash with eosinophilia. There was no evidence of nephrotoxicity; thrombophlebitis developed at the site of infusion in only 1 of the 22 patients who received the drug intravenously.

Comment

In vitro, cephapirin was very effective in inhibiting growth of gram-positive cocci except enterococci. *E. coli*, *Klebsiella* and *Proteus mirabilis* required greater concentrations of cephapirin for growth inhibition in brain-heart infusion broth than most gram-positive cocci. All strains of *Pseudomonas aeruginosa* and most of *Enterobacter* appeared to be highly resistant to this drug.

The geometric mean MIC of our strains of *E. coli* and *Proteus mirabilis* was significantly lower in nutrient broth than in brain-heart infusion broth. This may explain why the MIC's of cephapirin for strains of *E. coli* and *Proteus mirabilis* in our study were somewhat higher than those determined by some investigators.[7]

The MIC's of most strains of *E. coli*, *Klebsiella* and *Proteus mirabilis* were in a range of drug concentrations that could readily be achieved in the urine of patients with normal renal function. However, when considered in terms of serum concentrations achievable with the usual dosage regimens, bacteremia caused by some of those gram-negative bacilli might not be expected to respond to cephapirin. This was evident in one of our patients who had endocarditis due to a strain of *E. coli* requiring 50 μg/ml of cephapirin for growth inhibition. Bacteremia persisted despite 12 gm of cephapirin given intravenously daily for

Table 6

Results of Cephapirin Therapy in 4 Patients with Miscellaneous Infections

Infection	Causative Organism (M I C of cephapirin μg/ml)	Result of Treatment
Wound infection	*E. coli (7100)* and *Proteus mirabilis* (25)	Qualified success*
	Staphylococcus aureus (0.1)	Qualified success*
Chronic osteomyelitis	*Proteus mirabilis* (12.5)	Qualified success*
Septic arthritis	*Staphylococcus aureus* (0.2)	Qualified success*

*Lesion healed but post-treatment cultures were not obtained because there was no drainage material to culture.

several days; subsequently the bloodstream infection was eradicated with ampicillin (MIC = 4 μg/ml).

In general, cephapirin appeared to be effective for treatment of serious infections caused by susceptible organisms in patients who did not have underlying noninfectious diseases that precluded recovery. There was a low incidence of pain or phlebitis at sites of injection and no evidence of nephrotoxicity. The relatively high incidence of allergic reactions in our patients warrants further study. Since cephapirin is rapidly excreted in patients with normal renal function, parenteral doses should be given at intervals of at least every four to six hours. Dosage regimens of cephapirin for patients with impaired renal function require further study.

Table 7

Adverse Effects of Cephapirin*

	Number of Patients
Elevated SGOT	5
Eosinophilia	4
Drug fever	3
Elevated serum alkaline phosphatase	2
Leukopenia	1
Phlebitis	1
Generalized maculopapular rash	1
Bullous erythema multiforme	1
TOTAL	9**

*One patient with hemolytic anemia of multipotential etiology not included in table.

**More than one side effect was noted in several patients.

Summary

Two hundred ninety strains of gram-positive cocci and gram-negative bacilli were tested for susceptibility *in vitro* against cephapirin. The drug was highly effective in inhibiting growth of gram-positive cocci except enterococci. It was somewhat less effective against gram-negative bacilli. The mean serum half-life of cephapirin in persons with normal renal function was 0.6 hr. Cephapirin appeared to be effective for treatment of serious infections caused by susceptible organisms. There was a low incidence of pain or phlebitis at sites of injection and no evidence of nephrotoxicity. The relatively high incidence of allergic reactions warrants further study.

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PARENTERAL CLINDAMYCIN IN THE TREATMENT OF INFECTIONS

• A preliminary clinical study in a limited number of patients suggest that parenteral clindamycin is an effective well-tolerated agent in the treatment of gram-positive coccal infections.

Christopher Royer Donoho, Jr., M.D.

Clindamycin* (7-chloro-7-deoxylincomycin) is a lincomycin analogue and like the parent drug, has a narrow spectrum of effectiveness *in vitro* and *in vivo* against the gram-positive cocci, excluding the enterococci. Clindamycin and lincomycin are both small molecules with less potential for sensitization than the penicillin-type antibiotics and therefore may be useful in patients with a history of penicillin allergy or multiple drug sensitivities.

Clindamycin appears to be more effective *in vitro* than lincomycin, allowing a lower dosage of this analogue for clinical efficacy. The reported lower incidence of gastrointestinal side effects with clindamycin therapy may be the result of this lower dosage requirement.[1-3]

The oral preparation of clindamycin is available for clinical use in the United States, and there are a number of reports in the literature concerning its efficacy.[1-3] The parenteral form of clindamycin is available only for investigational use and less information is available concerning clinical experience with this preparation. This preliminary report records the experience in a study designed to evaluate the clinical efficacy of parenteral clindamycin in the treatment of infections due to gram-positive cocci (excluding enterococci).

Material and Methods

Twenty-one patients from the Medical and Surgical Services were selected for inclusion in the study. Thirteen of the patients were male, and eight were female, their ages ranging from 19 to 74. Several of the patients had a previous history of penicillin sensitivity, and all twenty-one patients were suffering from pneumonia and/or infections of the bone or soft tissue.

The antibiotic was supplied by the Upjohn Company as clindamycin-2-phosphate in 2 ml vials each containing 300 mg. The intravenous dose was 300 to 450 mg given by a rapid drip (30 minutes) every eight hours, while the intramuscular dose was 300 mg every eight to twelve hours. The duration of parenteral therapy usually ranged from two to twelve days though one patient with streptococcal osteomyelitis received the parenteral antibiotic for twenty-six days. In two patients the clindamycin-2-phosphate was first administered intravenously with a subsequent change to the intramuscular route.

Pre-and post-treatment cultures were obtained on all patients treated with clindamycin, and pre- and post-treatment hemograms, chemistry 12 profiles and urinalyses were obtained in most instances.

Results

Table 1 details the clinical data in seventeen of the twenty-one patients who had clinical evidence of bacterial pneumonia. Despite the clinical profile of bacterial pneumonia, ten of the original sputum cultures in these seventeen patients revealed only normal flora. In three patients the sputum culture revealed a pneumococcus and in an additional two patients, the cultures yielded pneumococcus and *Hemophilus influenzae.* In one patient, the original sputum culture grew a *Proteus* species. One of the seventeen patients showed no pathogen in the sputum culture

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*Cleocin® Upjohn Company, Kalamazoo, Michigan

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TABLE 1

PNEUMONIA PATIENTS TREATED WITH PARENTERAL CLINDAMYCIN

Number of Patients	ORGANISM	TREATMENT	RESPONSE
3	No pathogen	300-600 Q8h I.V. four-twelve days	Success
1	Pneumococcus	450 Q8h I.V. four days 600 Q12h six days	Success
1	Group A strep. blood	450 Q8h I.V. two days medication changed	Success
7	No pathogen	300 Q12h IM four-twelve days	Success
2	Pneumococcus	300 Q12h IM seven-eleven days	Success
2	Pneumococcus *H. influenzae*	300 Q12h IM nine-twelve days	Success
1	*Proteus* species	300 Q12h IM two days	Failure

though the blood culture grew a beta-hemolytic streptococcus (group A). Except for the one patient whose initial sputum culture revealed a *Proteus* species, all the pneumonia patients showed a satisfactory clinical response following parenteral clindamycin therapy given for two to twelve days. A satisfactory response is defined here as rapid (that is, eight to twelve hours) defervescence of fever, decrease of chest pain and malaise, and evidence of radiologic clearing of the area of infiltration.

Table 2 details the results of clindamycin therapy in six patients with infections of bone and/or soft tissues. Two of these six patients also suffered from pneumonia and were reported on the previous table. All six patients with soft tissue or bone infection showed a satisfactory response to parenteral clindamycin therapy. Two patients with osteomyelitis (in one instance due to beta-hemolytic streptococcus and the other to *Staphylococcus aureus*) experienced a successful outcome after twenty-six days' and ten days' therapy, respectively. Likewise, the patient with the eye infection due to coagulase-negative staphylococcus and the patient with *Staphylococcus aureus* infection of an ankle cutdown site, both showed a successful response to clindamycin therapy. A patient with sacral cellulitis due to a coagulase-positive *Staphylococcus aureus* and a beta-hemolytic streptococcus, responded to ten days of therapy with parenteral clindamycin. More difficult to evaluate was a patient with scrotal cellulitis with a multiplicity of microorganisms isolated from the wound surface. Four days of parenteral clindamycin followed by oral clindamycin therapy resulted in a satisfactory, though slow, response. Parenteral clindamycin therapy was successful in eliminating the pathogens from these bone and soft tissue lesions in each instance.

Side Effects

There were no untoward reactions to clindamycin in the twenty-one patients included in this study. No gastrointestinal disturbance or undue irritation at the site of administration was reported. There was no significant alteration in the hemogram, chemistry 12 profile or urinalysis in any of these patients. Four patients who received intramuscular clindamycin had significant elevations of creatinine phosphokinase with slight eleva-

TABLE 2

BONE AND SOFT TISSUE INFECTIONS TREATED WITH PARENTERAL CLINDAMYCIN

Diagnosis	Organism	Treatment	Response
Wound infection in ankle cutdown	*Staphylococcus aureus* Coagulase-positive	300 mg IM Q12h for eleven days	Success
Scrotal cellulitis	*Escherichia coli* *Enterobacter* Enterococcus *Bacteroides* Peptostreptococcus	300 mg IM Q12h for four days	Success
Eye infection*	Coagulase-negative Staphylococcus Group D strep.	450 mg I.V. Q8h for two days then medication changed	Success
Osteomyelitis**	Beta-hemolytic Strep. (not D)	300 mg IM Q12h for twenty-six days	Success
Osteomyelitis	*Staphylococcus aureus* Coagulase-negative	300 mg IM Q12h for ten days	Success
Sacral cellulitis*	*Staphylococcus aureus* Coagulase-positive Beta-hemolytic Strep.	300 mg IM Q12h for ten days	Success

*Patients also reported on in Table 1.
**Patient expired from acute myocardial infarction while on therapy.

tions of the serum glutamic oxaloacetic transaminase but no elevation in the liver enzymes. It was assumed that these abnormalities were due to the intramuscular administration of clindamycin.

In two instances, superinfection occurred while patients were receiving clindamycin therapy. One patient developed an enterococcal urinary tract infection, complicating bladder drainage with an indwelling bladder catheter while receiving I.V. clindamycin therapy. The second patient, also with an indwelling bladder catheter, developed a *Serratia* urinary tract infection while receiving intramuscular clindamycin. Both patients were subsequently successfully treated with an appropriate antibiotic.

Summary

This study was not designed to compare the effectiveness of clindamycin with the parent antibiotic lincomycin or other currently available antibiotics, but rather to afford clinical experience in the treatment of infections with the parenteral form of clindamycin. This new antibiotic appears to be similar to the parent compound in spectrum, efficacy, tolerance and toxicity. Twenty-one patients suspected of having gram-positive infections were treated with clindamycin with a satisfactory response in each instance except for a patient with bacterial pneumonia apparently due to *Proteus* species.

There were no significant gastrointestinal side effects with the absence of diarrhea being particularly noteworthy.

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PRELIMINARY REPORT ON INTRAVENOUS DOXYCYCLINE

• Tetracycline derivatives that do not depend upon renal excretion for elimination from the body should have less potential for accumulation in the body and production of the catabolic tetracycline side effects.

William J. Holloway, M.D.

Doxycycline, the newest of the oral tetracyclines to be available for clinical use in the United States, differs from the older tetracyclines in several pharmacokinetic properties. This antibiotic appears to be rapidly and almost completely absorbed from the gastrointestinal tract, and a slow elimination rate results in a half life of about twenty hours. The renal clearance of doxycycline is about 23 ml per minute, this being significantly less than the other tetracycline compounds. Apparently the liver is responsible for most of the clearance of doxycycline from the body.

This new tetracycline has been used successfully in the treatment of acute and chronic urinary tract infections,[1,2] being effective in a once daily dosage because of the prolonged half life and excellent blood levels after oral absorption. The reported[1,2] low incidence of side effects from doxycycline may be due in part to the lower total dose of tetracycline administered to the patient.

There is limited evidence[2] that doxycycline is more effective *in vitro* against certain strains of *Pseudomonas aeruginosa*, and patients with chronic *Pseudomonas* urinary tract infection have been controlled with long-term doxycycline therapy after failing to respond to other antibacterial agents.[2]

Tetracycline's catabolic effect on cells, mediated through its interference with the absorption of essential amino acids,[3,4] has limited the use of this antibiotic in patients who are critically ill with concurrent impairment of kidney and liver function. Klinger and his coworkers[5] have suggested that doxycycline might be given safely to patients with renal insufficiency because drug accumulation and cumulative toxicity are not to be expected. Additional clinical experience is necessary to further substantiate this hypothesis. This paper is a preliminary report on the clinical trial of an intravenous formulation of doxycycline.

Material and Methods

Patients on the Medical and Surgical Services of the Wilmington Medical Center in whom tetracycline appeared to be the antibiotic of choice were considered as candidates for inclusion in this study. Since this tetracycline was to be administered by the intravenous route, an additional prerequisite was that the patient require parenteral administration of antibiotic because of the inability to swallow or tolerate oral medication.

The intravenous preparation of doxycycline* was supplied by Charles Pfizer and Company in a powder form and was dissolved in 500 to 1000 ml of diluent (5% glucose and water or normal saline solution) for intravenous administration. Patients treated early in the study were given 100 mg of doxycycline dissolved in 500 ml of diluent as a drip over four to six hours. Because of local irritation (to be described later in the paper) subsequent patients were given doxycycline 100 mg

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*Vibramycin®

dissolved in 1000 ml of diluent administered over a period of eight to twelve hours. The intravenous doxycycline was administered for a minimum of three days in all patients and in some patients as long as nine days (mean duration of intravenous doxycycline therapy equals four days). In all but two patients the intravenous doxycycline was followed by a course of oral doxycycline therapy.

Pre- and post-treatment cultures were taken on all patients included in the study, and the pathogens isolated were tested for doxycycline susceptibility by the agar-disc diffusion technique and in some instances by the test-tube dilution technique. When feasible, follow-up cultures were done on the day intravenous doxycycline therapy was discontinued as well as at the completion of all antibiotic therapy. Other laboratory parameters measured before and after doxycycline therapy included complete blood count with platelet count, chemistry 12 profile and urinalysis. In instances where there was an elevation of the blood urea nitrogen, the serum creatinine was also measured serially. A total of 22 patients have now been treated with this intravenous formulation of doxycycline.

Results

Table 1 details the type of infection present in the twenty-two patients treated with intravenous doxycycline and the results of therapy. Fourteen patients with urinary tract infection received this antibiotic with ten patients experiencing a successful outcome. One patient failed to respond to therapy, and three patients were characterized as having an indeterminate response. Eleven of the fourteen patients were considered to have acute urinary tract infection while two patients were classified as chronic. In one patient there was a history of recurrent infection.

The patient who failed to respond to tetracycline therapy was a 34-year-old female patient with end stage renal disease and chronic pyelonephritis who failed to respond to therapy with several other antibiotics prior to the administration of intravenous doxycycline.

One patient with an indeterminate result was a 33-year-old female patient who had acute pyelonephritis associated with peritonitis and pneumonia. Bacteriuria (*Escherichia coli* and *Pseudomonas aeruginosa*) was eradicated by doxycycline therapy, but the fever did not defervesce during her course of therapy.

The second patient with an indeterminate response to intravenous doxycycline was a male patient with Reiter's Syndrome, the urethritis apparently due to mycoplasma T-strain. While he showed significant improvement during intravenous doxycycline therapy, his response was slow, and complete clearing required ten days of oral doxycycline therapy.

An additional indeterminate response was in a patient in whom doxycycline therapy was instituted when bacterial infection complicating an indwelling Foley catheter was suspected. The patient improved on intravenous doxycycline therapy, but initial cultures of the urine were negative. The indwelling catheter was subsequently removed, and a culture of the catheter tip revealed a significant growth of *Staphylococcus aureus*, tetracycline sensitive. While this patient appeared to have a satisfactory response on doxycycline therapy, the absence of a positive culture prior to the institution of therapy precludes conclusive evaluation.

Six of the twenty-two patients included in this study were treated for bacterial pneumonia, and all six patients responded to therapy. In three instances the infecting microorganism was *H. influenza*, and in one instance each, the primary pathogen was beta streptococcus, pneumococcus and *Mycoplasma pneumoniae.*

A patient with septicemia due to *Klebsiella* type 35 failed to respond to intravenous doxycycline therapy. This patient was in a terminal stage of leukemia and had failed to respond to numerous other antibiotic agents prior to a trial with this antibiotic.

The final patient in this study was a twenty-six-year-old female with gonococcal cervicitis, urethritis, and pyarthrosis who showed a favorable clinical response to three days of intravenous doxycycline therapy and negative cultures at the time oral doxycycline therapy

Table 1

Results of Therapy
Intravenous Doxycycline

Type of Infection	Number of Cases	Success	Failure	Indeterminate
URINARY TRACT	14	10	1	3
PNEUMONIA	6	6	0	0
SEPTICEMIA (*Klebsiella* type 35)	1	0	1	0
GONOCOCCAL Cervicitis-Pyarthrosis	1	1	0	0

was substituted for the parenteral preparation.

Side Effects and Toxicity

Significant local phlebitis with severe pain occurred in five patients receiving intravenous doxycycline therapy in this study. In all five of the patients, the phlebitis necessitated frequent changing of the intravenous catheter site, and in one patient it was necessary to discontinue intravenous doxycycline therapy on the third day because of severe distress. It should be noted that all five of the patients who experienced significant local irritation from the intravenous doxycycline were receiving 100 mg of the antibiotic dissolved in 500 ml of diluent. The remaining patients who received their doxycycline in 1000 ml of diluent did not complain of significant local irritation and experienced an incidence of local phlebitis comparable to that seen in our institution in patients receiving any type of intravenous therapy.

Five patients in this study group had a significant elevation of blood urea nitrogen at the time intravenous doxycycline therapy was instituted. All of these patients tolerated the intravenous doxycycline therapy well and did not show any significant elevation of blood urea nitrogen during therapy. In fact, four of the five patients experienced a significant decrease in the blood urea nitrogen level during the period of administration of the intravenous antibiotic.

In one patient there was a significant increase in the blood urea nitrogen level during doxycycline therapy. This was a 54-year-old-female patient with diabetes mellitus and congestive heart failure who required an indwelling bladder catheter on admission to the hospital and subsequently developed a symptomatic urinary tract infection due to a *Klebsiella* species and an enterococcus. The catheter was removed and intravenous doxycycline therapy instituted. At this time the blood urea nitrogen was 33 mg/100 ml, the serum creatinine was 2 mg/100 ml and a creatinine clearance was 15.3 ml/min. Intravenous doxycycline in a dosage of 100 mg twice daily was continued for a five-day period, and the patient was subsequently placed on oral doxycycline in the same dosage. Because of a technical error, the blood urea nitrogen was not determined until two days after intravenous doxycycline was discontinued. At this time the blood urea nitrogen was 123 mg/100 ml, and the serum creatinine 3 mg/100 ml. The oral doxycycline was discontinued on the following day, and blood urea nitrogen determinations done daily revealed an elevated level for an additional week. Eleven days after cessation of doxycycline therapy, the blood urea nitrogen was 16 mg/100 ml and the serum creatinine 1.5 mg/100 ml. It is conceivable that this occurrence represents an instance of the uremic syndrome occurring in a patient on doxycycline therapy. However, the attending physician responsible for this patient was of the opinion that untimely removal of the indwelling bladder catheter as well as dehydration may have been contributing factors in the elevation of the blood urea nitrogen. It should be noted that there was a minimal increase in the serum creatinine level during the uremic period.

Summary

Doxycycline, the newest tetracycline antibiotic, has a low renal clearance in normal individuals, suggesting that it may have less potential toxicity in critically ill patients with impaired renal function.

This preliminary clinical report on intravenous doxycycline records satisfactory results in ten of fourteen patients with urinary tract infection and all six patients with bacterial pneumonia. A patient with terminal leukemia and *Klebsiella* type 35 septicemia failed to respond to the antibiotic, while a patient with gonococcal pyarthrosis complicating cervicitis and urethritis did respond to intravenous doxycycline therapy.

Local phlebitis with severe burning discomfort at the injection site was common in patients who received the 100 mg dose of doxycycline dissolved in only 500 ml of diluent. When the quantity of diluent was increased to 1000 ml, this local irritation no longer occurred.

Five patients with significant elevation of the blood urea nitrogen at the time intravenous doxycycline therapy was instituted showed no evidence of doxcycline toxicity. A fifty-four-year-old diabetic with pyelonephritis and pulmonary edema had slight elevation of the blood urea nitrogen and serum creatinine at the time therapy with doxycycline was instituted. During subsequent therapy with the intravenous and oral preparation of the antibiotic, there was a marked rise in blood urea nitrogen with a slight rise in serum creatinine. After cessation of therapy, these parameters slowly returned to normal. Factors other than doxycycline therapy may have been responsible for these altered laboratory values.

Further clinical trial of intravenous doxycycline seems warranted and is underway at the Wilmington Medical Center.

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* * *

LOUIS PASTEUR (1822-1895)

I do not forget that Medicine and Veterinary practice are foreign to me. I desire judgment and criticism upon all my contributions. Little tolerant of frivolous or prejudiced contradiction, contemptuous of that ignorant criticism which doubts on principle, I welcome with open arms the militant attack which has a method in doubting and whose rule of conduct has the motto "More light."

The Germ Theory and Its Applications to Medicine and Surgery, Ch. 12,
Sect. III (tr. by H. C. Ernst)

President's Page

PLANNING OUR RESOURCES

Health care planning for a comprehensive approach is now a *disarray* of data and proposed solutions. Medical care by physicians is a small fragment of the total aspects of health. Physicians do have a large role in planning. Our experiences and knowledge prepare us to make recommendations as significant contributions. The State of Delaware, having certain physical similarities to the *morass*, might be the appropriate first state to pioneer health care planning and delivery out of the *confusion*, *turmoil*, and *perplexities*.

Health planning has been defined as an orderly, coherent, and total process of defining health problems, uncovering and appraising unmet needs, surveying the resources available to meet all needs, establishing realistic and feasible goals, assigning priorities, and considering various alternative approaches towards achieving these goals. Planning is now fragmented with duplication and gaps. Uncoordinated efforts waste our limited fiscal resources and precious manpower. There is planning by Federal agencies, the State of Delaware Department of Health and Social Services, State Comprehensive Health Planning Council, Greater Delaware Valley Regional Medical Program, Health Planning Council, University of Delaware Technical Services, voluntary health agencies, hospitals, industries, and others, directly and indirectly, preventing and minimizing the impairment of health through ecology, housing, social and economic factors.

Federal laws include P.L. 89-749, "Comprehensive Health Planning and Public Health Service Act of 1966," with consumer-oriented support. Contained in the law are: Sec. a. State level planning for health services, health manpower, and health facilities; Sec. b. Health planning councils for areas within the state; Sec. c. Training studies and demonstrations in health planning; Sec. d. Categorical grants for the usual public health programs with greater discretion in the expenditure of funds; Sec. e. New and innovative methods.

P.L. 90-170, extends and expands with the "Partnership for Health Amendments of 1967" along with P.L. 91-515. The Regional Medical Program law is provider-oriented and has the potential of changing quality and quantity of health care systems.

In 1970 Delaware was the 50th ranking state as recipient of Federal funds and the 49th ranking state in receipt of funds from HEW. Greater than 100 million dollars of health-related Federal funds were received from multiple agencies.

Governor Russell W. Peterson has requested for Delaware a separate Regional Medical Program, withdrawing from the present GDVRMP as of April 1, 1972. A second significant development is the consideration of a pioneer program for Delaware with the formation of two autonomous incorporated organizations which are disassociated from direct State control, but under the "supervision" of the Governor and Secretary of Health and Social Services: The *Delaware Health Services Authority, Inc.*, including providers, payers, public and political groups, and the *Delaware Health Services Planning Council, Inc.*, making a coalition of existing "a" and "b" agencies of P.L. 89-749, R.M.P., and others. Separation of planning functions from priority decision making and fund disbursement would occur, achieving a unified mechanism for channeling public funds from all sources and private funds on a volunteer basis into the health care system and maintaining a pleuralistic approach with more effective planned programs.

H. M. Baganz

In Brief

In the News

Names of the charter diplomates of the American Board of Family Practice were announced in the October 1971 issue of the *American Family Physician.* Delawareans included are Jason L. Campbell, M.D., William H. Duncan, M.D., Jack Gelb, M.D., Robert C. Kingsbury, M.D., Ethel F. Platt, M.D., David Platt, M.D., David Rich, M.D., William D. Shellenberger, M.D., Leo F. Sherman, M.D., Dene T. Walters, M.D., Barrie L. Weisman, M.D., and Henri F. Wendel, M.D. All are members of the Delaware Academy of Family Physicians.

At the 75th Anniversary celebration of the Philadelphia Pediatric Society, October 9, 1971, Margaret I. Handy, M.D. was honored for 50 years and John W. Maroney, M.D. for 40 years of service to children.

Four Delaware physicians who met the high standards of the American College of Surgeons were inducted as Fellows during their annual five-day Clinical Congress held recently. They are: J. Robert Fox, M.D. and Rafael A. Zaragoza, M.D. of Dover and Martin Gibbs, M.D. and Mustafa Oz, M.D. of Wilmington.

Speakers on "Ask the Doctor"

Speakers for December 1971 on the Tuesday Radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: December 7, Carl P. Mulveny, M.D., *Cirrhosis of the Liver;* December 14, Marvin Dorph, M.D., *Diabetes;* December 21, Arthur Heather, M.D., *Low Back Pain Due To Bad Posture;* December 28, Richard Morgan, M.D., *What Is An Internist?*

DLPP Report

Did you know that Delaware: • has a 23% growth rate compared to the 13% national growth rate? • has a population explosion: 64,000 births from 1960-1970? • has a population implosion: 38,000 immigrants from 1960-1970? • spent $10 million in 1970 for Aid to Dependent Children? • according to 1970 figures, has an illegitimacy rate of 15%? *Annual Report, Delaware League for Planned Parenthood.*

Inter-Agency Conference on Alcoholism

Approximately 215 people attended the first Inter-Agency Conference on Alcoholism for the State of Delaware, *Alcoholism in Delaware Today and Tomorrow*, October 7, 1971. Emphasis was placed on the need for education of professionals, public legislators and physicians. Physicians are so oriented to the chronically- and medically-ill alcoholic individual that they carry their attitudes of hopelessness and disdain into their practice and immediately turn "off" the early or potential alcoholics; eg, where family history of alcoholism predisposes to alcoholism. Joyce Z. Pearson, M.D., conference chairman, called for commitment, communication and creativity.

Health Care Systems

The National Center for Health Services Research and Development of the Department of HEW has recently awarded the Department of Industrial Engineering at the University of Missouri — Columbia a training grant to support a Ph.D. program in Health Care Systems Design. The program emphasizes industrial engineering analysis tools, as well as medical diagnosis and treatment practice, health care organization, and methods of health care systems evaluation. A limited number of openings for admission and financial support are available to persons with a strong quantitative background who are interested in the program. Write to H. Allan Knappenberger, Ph.D., Professor and Director of Graduate Studies, Department of Industrial Engineering, University of Missouri, Columbia, Mo., 65201.

ABFP Certification Exams

The American Board of Family Practice announces that it will give its next examination for certification in various centers throughout the United States. The examination will be over in a two-day period on April 29-30, 1972. Information regarding the examination can be obtained by writing: Nicholas J. Pisacano, M.D., Secretary, ABFP, Inc., University of Kentucky Medical Center, Annex 2, Room 229, Lexington, Kentucky, 40506. Deadline for receiving applications in the Board Office is February 1, 1972.

CLINICAL NOTICES AND MEETINGS

N.J. Annual Meeting

The Annual Meeting of The Medical Society of New Jersey provides an excellent opportunity for physicians from neighboring areas to present their work. The 206th Annual Meeting of the Medical Society of New Jersey will be held May 6-9, 1972, in Haddon Hall, Atlantic City. Applications for space in the 1972 Scientific Exhibits are available through the Medical Society of Delaware office. Call 658-7596 for information.

PG Medical Education Activities

The American Academy of Facial Plastic and Reconstructive Surgery, Inc., has announced five postgraduate medical education activities. *Surgery of the Aging Face, Concepts of Soft Tissue Surgery, Rhinoplasty Workshop, Workshop in Advanced Rhinoplasty, and Maxillofacial Trauma.* All are accredited by the AMA Continuing Education Program. Information pertaining to particular workshops can be obtained from Alfred K. Walter, Vice President, Public Relations, Beaumont, Heller & Sperling, Inc., Sixth and Walnut Streets, Reading, Pa., 19603.

PG Program

The Maternal and Child Health Program of the University of California School of Public Health announces postgraduate courses of instruction for pediatricians, obstetricians, and other physicians interested in receiving training in the field of Maternal and Child Health, which all lead to the degree of Master of Public Health. Tax-exempt Fellowships are available, consisting of support for the trainee and his dependents, tuition and fees. Applications are now being accepted for the group entering September 1972. For information, write to Helen M. Wallace, M.D., School of Public Health, University of California, Berkeley, Calif., 94720.

CLASSIFIED AD SECTION

Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

CARDIOLOGIST: Board-certified in internal medicine. Graduate, State University of New York. Residency at Kings County Downstate Medical Center. Research Fellow in Cardiology, University of Rochester Medical School and Strong Memorial Hospital. Currently in service.

Delaware Medical Journal

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COAL WORKERS' PNEUMOCONIOSIS

• **In addition to the well known silicosis, coal workers' pneumoconiosis (CWP) is a common cause of respiratory disability in coal miners. Its pathophysiology and epidemiology are discussed.**

Peter R. Graze, M.D.

In the past several years there has been a notable increase in interest in occupational lung disease. The pneumoconioses associated with coal mining have received particularly close scrutiny, and several valuable reviews have been published recently.[1-6] Although coal workers' pneumoconiosis (CWP) was first recognized in Great Britain in 1936,[3] by its Medical Research Council, American physicians largely ignored this condition until the last decade, and in the US the concept of CWP as a distinct disease continues to meet some resistance.[7] American miners who have suffered from occupational lung disease in the past have been able to receive compensation only on the basis of demonstrated silicosis, or "anthrosilicosis."

In the past two years the definition of occupational lung disease among coal miners has been broadened to include at least some cases with definite evidence of a pneumoconiosis not necessarily silicosis. But in all the member countries of the European Coal and Steel Community, the principle of partial disability due to coal pneumoconiosis is well accepted.[3] It is important to recognize the differences between CWP and silicosis; in this way, the approach to preventive measures and workmen's compensation may be more appropriate. This paper will review the pathology and pathophysiology of CWP, particularly the contrast between it and silicosis so far as these have been determined.

Whether a miner's pneumoconiosis is likely to be primarily a pattern of silicosis or CWP depends in large measure on the relative quantities of coal dust and silica dust he has inhaled. As Penman points out: "In coal miners whose lung dust contains 18% or more of quartz, the lesion is likely to be morphologically that of silicosis. As the quartz content of the lung falls below 18%, the morphologic lesion more closely resembles that of CWP."[6]

Inhalation of silica particles less than five microns in size causes a relatively well-defined alteration in lung structure and function. The particles cause a fibrotic response in the lung, with characteristic deposition of collagen in a

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Dr. Graze became actively involved in the study of occupational lung disease in 1968, when, as a Public Health Service Trainee, he undertook an investigation of coal workers' pneumoconiosis in the coal fields of West Virginia. He is currently an Intern in Medicine at the Massachusetts General Hospital, Boston.

whorling, circular pattern. These nodules of fibrosis tend to accumulate in the middle and upper lung fields and probably represent the nodularity seen radiographically. In addition, eggshell calcification of the hilar lymph nodes is common and may be a pathognomonic sign of the disease. Characteristically, significant silicosis results in alterations of pulmonary function, which may be documented on standard pulmonary function tests. There is a decrease in maximum breathing capacity (MBC), vital capacity (VC), and the forced expiratory flow rate (FEV_1).[3,4,8-10]

Inhalation of coal dust is the cause of CWP.[1,6,8,11] Like silicosis, CWP is a progressive disease with a variable rate of progression. While early stages are dependent on continued exposure, complication by massive fibrosis may occur once the disease has progressed.[2,12] Simple CWP is seen as black spots throughout the lungs. These black spots consist of small aggregations of dust, 1-5 mm in diameter, mostly within macrophages. This coal macule may be surrounded by fibrous tissue, but it is a loose reticulum, less dense than in silicotic nodules, and with less organization. The coal macules are located in the region of the divisions of respiratory bronchioles and their accompanying arterioles. The respiratory bronchioles may be dilated, resulting in a focal emphysema.[3,6,13-15] The nodules of silicosis, on the other hand, may be associated with a stenosis of the respiratory bronchiole.[12] If indeed these small 1-5 mm lesions are responsible for the physiologic alterations in lung function,[7,16] then the reason for the very poor correlation between symptomatology and radiographic findings[1,3,8,9,16-18] may be that the lesions, since they are minimally fibrosed, are not consistently identified on x-ray examination.

Exertional dyspnea, the most common complaint, usually does not become significant until the miner has spent at least ten years in the mines.[3,6,7,18] As Hyatt et al pointed out: "There was a relationship between years worked underground and impairment of pulmonary function which could not be explained by age, smoking, or x-ray category of pneumoconiosis."[18]

Significant disability may occur with CWP in the absence of x-ray findings.[7,16,19] According to Branscomb: "In simple pneumoconiosis no correlation has been demonstrated between x-ray category and either symptoms or physiological impairment . . . thus in simple pneumoconiosis the x-ray has no value in predicting the presence or level of functional impairment in the individual miner."[20]

Correlations

Despite the reduced MBC of miners compared to nonminers, there is no correlation between MBC and the degree of severity of simple pneumoconiosis.[6,8] There is a correlation between the impairment of MBC (and VC and FEV_1) and the degree of complicated pneumoconiosis.[10] This probably is a consequence of the extensive fibrosis and destruction of parenchyma in the latter, resulting in significant impairment of pulmonary mechanics. As already indicated, however, significant degrees of CWP may exist in the absence of comparable x-ray findings or fibrosis. In these patients, one would not expect to find significant abnormalities of routine pulmonary function tests, for these tests measure only mechanical function. It is thus not surprising that several investigators, using standard pulmonary function tests, were unable to demonstrate a consistent physiologic abnormality in miners with primarily CWP.[8,18,21] The conclusion that simple CWP caused no objective impairment of lung function has been drawn by many physicians.[7] This is an unjustified conclusion, for it ignores the important data on gas transfer which have recently been accumulating.[1,3,16,19]

In addition to dyspnea, affected miners typically demonstrate inappropriate hyperventilation with exercise.[16] The average arterial and alveolar oxygen tensions (PaO_2 and PAO_2, respectively) for those miners with mild to moderate disability are within the normal limits, age corrected, of 70-80 mm Hg. However, the alveolar-arterial oxygen tension gradient (A-a gradient) rises abnormally with exercise.[9,16] Tests of the MBC or the FEV_1 are not necessarily abnormal. Rasmussen and Nelson[19] found that many subjects with normal VC were highly symptomatic. Impairment of O_2 transfer to "at least moderate degrees" was almost invariably present in these cases. While these workers had earlier demonstrated abnormalities in the single breath nitrogen washout among symptomatic miners,[16] they report a poor correlation between the seven minute end-alveolar nitrogen concentration and the degree of A-a gradient abnormality. This suggests that while abnormal ventilation-perfusion matching exists, it does not alone account for the A-a gradient abnormality demonstrated during exercise in miners with pneumoconiosis.

The mechanism of the hyperventilation with exercise remains obscure, but Nadel[22] has pointed out that dyspnea associated with a normal arterial PO_2, decreased PCO_2, and increased pH (respiratory alkalosis) may be explained by abnormal stimulation of baroreceptors in the pulmonary vascular tree by increased pulmonary vascular pressure during exercise. Cor pulmonale is commonly associated with complicated pneumoconiosis, but is less often seen clinically with simple pneumoconiosis.[3,6] In a study of 1000 autopsies of coal workers, 15% were found to have predominant perivascular and diffuse dust retention with insignificant nodulation in the lungs. In these cases, the incidence of right ventricular hypertrophy was almost 100%.[16] In a study of 202 random autopsies that included 150 miners, all of whom had worked 15 years or more in the coal mines, 61 of the 150, or 40.7%, had anatomic evidence consistent with right heart hypertrophy. Forty of these had been clinically diagnosed before death. Nineteen percent of all miners in this study had definite right heart hypertrophy or failure with no other chronic lung disease than simple CWP. Only seven of the 43 cases of atherosclerotic heart disease found in this study exhibited increased right ventricular mass.[13]

Coal workers' pneumoconiosis is a disease distinct from chronic obstructive lung disease and the effects of aging or smoking. While the nodularity which is characteristic of silicosis often is reflected in the chest x-ray, the extent of disability or ventilatory impairment in CWP is not reliably reflected by the x-ray findings. The nodulation and fibrosis of pure silicosis is reflected in altered pulmonary mechanics; appropriate history, chest x-ray, and pulmonary function tests are essential in the diagnosis of silicosis. CWP is characterized by an impairment of oxygen transfer in the absence of ventilatory insufficiency, consistent with a loss of parenchyma and a diffuse, focal emphysema without associated consistent restrictive or obstructive deficits. In addition to the exposure history and pulmonary function tests, an assessment of gas exchange at rest and during exercise is essential for a meaningful evaluation of CWP. Most miners will have been exposed to silica and coal dust; they present with a mixed pneumoconiosis. Their symptomatology may not correlate with chest x-ray findings. Pulmonary function tests and measurements of gas exchange are required for their evaluation.

Exposure Greater in Large Mines

The prevalence of pneumoconiosis in coal miners is reported to be much greater among miners in large mines than among miners in small mines. This may be related to dust exposure level, daily exposure time, or both.[23] There is evidence that the mechanization of American mines has contributed to increased dust levels and an increased incidence of pneumoconiosis. The incidence of pneumoconiosis as determined by x-ray (not symptomatology) among working miners is often stated to be 10%.[3,4,6,24] Lainhart[24] has provided a breakdown of this figure according to occupation: cutting machine operators, 22%; loading machine operators, 17%; and hand loaders, 11%. Water spray, often recommended for use with the cutting and drilling machines but not always used, does not appreciably decrease the respirable dust once it is airborne, although wet drilling and cutting operations may keep dust from becoming airborne.[6]

Dust measurement should be made on the basis of respirable mass rather than dust particle count for environmental control.[3,11] The Public Health Service recently recommended a level of no more than 3.0 mg of dust per cubic foot of air;[3] the 1970 Mining Health and Safety Act, however, allows a level up to

4.5 mg/ft.[25] In contrast, the British National Coal Board and National Joint Pneumoconiosis Committee recommended no more than 8 mg/m^3 of dust in return air leaving the coal face. This maximum level, one-fifth the American standard, has been the law in Great Britain since April 1970.[11] In the United States, the risk of death among coal miners has been nearly twice that of the general population, and higher than that of any other occupational group in this country.[2,6] By contrast, British miners have only a 15% greater risk than the British general population.[6]

There is currently no cure, or even treatment, for the pneumoconioses of coal miners.[3,25] The best approach to occupational disease is prevention. In the coal mines, this means considerably reducing the dust levels. Miners currently have neither job security, adequate protection, nor an alternative to further exposure. Only adequate environmental dust controls and removal of minimally affected miners from the dusty environment can reduce the incidence of these occupational pneumoconioses.

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OF MAN AND HIS MACHINES

As man fails to adjust and make technology his servant, he defaults. He creates a role for himself in such an electronics age as a mere robot member, an anonymous cog in an unthinking, or at least impersonal, massive interconnected network of computers, cables, switches, relays, vehicles, transistors, blinking lights, and whirring buzzers. It will be difficult to distinguish man from machines. It appears, at the least, that man will have a new partner; a man/machine partnership will replace man alone in the handling of all of the information and intellectual activities that make the world go round. We have not so far found ways to innovate in social patterns so that this new marriage of man and electronic machine will be compatible, healthy, and distinctly to man's advantage. It will be partially so, of course, but the dislocations, maladjustments, and confusions that will result as man must share the world more and more with newer machine partners are developments justifiably to be feared.

From Simon Ramo, Cure for Chaos, David McKay Company, Inc.
Medical Opinion & Review, September, 1969.

PROCEEDINGS OF THE HOUSE OF DELEGATES, 1971

MEDICAL SOCIETY OF DELAWARE

The 182nd Annual Session of the House of Delegates, Medical Society of Delaware, was called to order at the Maple Dale Country Club, Dover, Delaware, on Friday, October 8, 1971, at 3:00 P.M., Rhoslyn J. Bishoff, President, presiding.

Secretary Abbiss took the roll call and a quorum was declared.

A motion was made, seconded, and approved to accept the minutes of the 1970 Session as published in the Delaware Medical Journal.

(All reports were accepted as published.)

REPORTS OF THE OFFICERS

REPORT OF THE SECRETARY

One hundred six meetings including today's meeting were held during this past year. Eight meetings were devoted to the transaction of business matters by the Board of Trustees; in addition, there were 97 committee meetings for which preparations were made by the Society office and one meeting open to all Society members. The dinner-dance will be held October 9 at Dover Downs. All business transacted by the Society has been recorded in the minutes as presented by the Secretary.

The total membership as of October 1 is as follows:

1971

	Dues-Paying Members	Dues-Exempt Members	Total
Kent	37	4	41
New Castle	375	49	424
Sussex	60	7	67
	472	60	532

1970

	Dues-Paying Members	Dues-Exempt Members	Total
Kent	36	4	40
New Castle	375	46	421
Sussex	57	7	64
	468	57	525

The Society has had inquiries from 55 out-of-state physicians seeking placement in Delaware plus 52 inquiries received via AMA. The office has corresponded with these physicians and acted as the liaison between them and local physicians who are seeking associates. Complimentary ads have been placed in the Delaware Medical Journal for doctors seeking local opportunities. The office requests that doctors who are seeking associates so inform it.

Joseph W. Abbiss, M.D., ***Secretary***

REPORT OF THE TREASURER

The report of the Treasurer for 1970-1971 is in two sections. The first consists of a statement of income and expenses for the twelve months of calender 1970. This has been prepared by Haggerty and Haggerty, certified public accountants, and is presented from their 1970 audit of the Society's accounts.

The second section is a statement of income and expenses for the first nine months of 1971. This is not audited at the moment, since it is an interim report. The audit for 1971 will be done at the end of this calendar year.

PART I

STATEMENT OF INCOME AND EXPENSES CALENDAR 1970

Bank Balance Checking Account — December 31, 1969		$ 2,302.11
Operating Receipts		42,010.11
Contra Receipts	$41,128.49	
Contra Disbursements	44,422.78	
Balance from Contra Funds held in account		—3,294.29
TOTAL OPERATING RECEIPTS		$31,017.93
Operating Disbursements		
Salaries		$24,140.00
Employer taxes		1,024.97
Hospitalization		898.08
Employee Benefits		2,314.40
Insurance		359.00
Travel and Expenses		4,265.33
Office Operation		8,853.90
Subscriptions, Contributions, Dues		1,069.00
Operation of Commitees		2,402.33
Campaign — AMA Vice President		2,555.44
Defense — Medical Examiner		1,000.00
Grant — Woman's Auxiliary		800.00
Miscellaneous		111.90
TOTAL DISBURSEMENTS		$49,794.25

Reimbursable Expense	$ 7,612.92	
Reimbursed Expense	$ 4,909.48	—$ 2,703.44
Balance Checking Account — December 31, 1970		$ 1,233.48

ASSETS

INVESTMENTS	
Stock	$25,023.70
Loan to Delaware Medical Journal	5,000.00
SAVINGS ACCOUNTS	
Wilmington Savings Fund Society	8,297.52
Artisans	3,615.24
CHECKING ACCOUNTS	
December 31, 1970	1,233.48
TOTAL ASSETS	$43,169.94

PART II

TREASURER'S REPORT

OCTOBER 1, 1971

	Budgeted	Actual	
Bank Balance, December 31, 1970			$ 1,233.48
RECEIPTS			
Dues	$37,209.00	$35,184.50	
Interest	5,437.00	5,038.79	
Miscellaneous		107.30	$40,330.59
Addressograph	200.00		
Kent County Dues		$ 780.00	
Sussex County Dues		655.00	
AMA Dues		41,283.40	
Delaware Medical Journal		2,673.00	
Commission— AMA	446.00	2.45	
Scholarship Fund		2,237.50	
Annual Meeting	7,400.00	3,923.25	
Sports Seminar		4.50	$51,559.10
Artisans's Bank (Transfer — Interest Purposes)			10,000.00
Reimbursed			1,478.23
			$104,601.40

DISBURSEMENTS			
Scholarships	$ 2,355.00	$ 2,000.00	
Blood Bank	220.00	262.00	
Office	2,460.00	2,278.17	
Telephone	1,200.00	1,104.51	
Stationery-Postage	2,000.00	2,089.50	
Salaries	24,140.00	18,875.62	
Employer Taxes	1,575.00	974.73	
Employee Benefits	2,886.00	1,605.79	
Travel	4,216.00	1,717.60	
Committee Expenses	3,000.00	1,015.98	
Contributions	333.00	175.00	
Capital Expenses		973.45	
Insurance	270.00	147.00	
Delaware Medical Journal	2,900.00	2,376.00	
AMA Dues	44,660.00	40,885.00	
Sussex County		560.00	
Kent County		780.00	
Legal Counsel		750.00	
Miscellaneous		51.00	
Audit	300.00	300.00	
Annual Meeting		200.00	
Rent (Academy) 1st Quarter	2,500.00	781.25	$ 79,902.60
Artisans' Bank (Transfer — Interest Purposes)			$20,000.00
Reimbursable			788.67
			$100,691.27
Bank Balance, October 1, 1971			$ 3,910.13

Conley L. Edwards, M.D., ***Treasurer***

REPORTS OF THE STANDING COMMITTEES

BUDGET COMMITTEE

The Budget Committee after due consideration submits the same total budget for estimated expenditures for 1971-1972 as was submitted for 1970-1971.

When the 1970-1971 budget was made and submitted, it was strongly recommended that due consideration be given to raising the Society dues, but it was elected by the House of Delegates to utilize a portion of our reserve to meet the needs for this year. To date, our reserves have been expended in the amount of approximately $1,000. Most of this was utilized by our committees, all of which are becoming more active and will require more money next year, 1971-1972.

Our expenditures are increasing for hospitalization for our employees, printing, postage, stationery, insurance, a requirement for additional office help, more space requirement for our increasing activities, and cost of living allowances. It should be pointed out that our present activities and involvement have been curtailed because of an effort to stay within our budget as projected.

A major increase for the coming year will be a 25% increase in rent, and an additional charge for the use of meeting space required by our committees' work. This bcame effective July 1, 1971. The additional charge for meeting space was not included in the proposed budget because of lack of any experience in this area.

From the above, it is evident that a dues increase or further usage of our reserve fund is inevitable.

A recommendation by your chairman and treasurer is made for an allowance for the President of our Society in order to enable him to be more active as a representative of our Society.

OPERATING RECEIPTS			
Addressograph			$ 200
Dues (468 dues paying members)			36,972
Dividends & Interest			7,000
(From Reserve)			1,828
TOTAL RECEIPTS			$46,000
CONTRA RECEIPTS			
AMA Dues		$41,283	
AMA Dues Rebate		446	
Scholarships		2,237	
DMJ Subscription		2,808	
Annual Meeting			
Exhibits	3,050		
Grants	2,100		
Banquet Ticket Sale	2,500	7,650	
TOTAL		$54,424	
CONTRA DISBURSEMENTS			
AMA Dues		41,283	
AMA Dues Rebate		446	
Scholarships		2,237	
DMJ Subscription		2,808	
Annual Meeting		7,650	
TOTAL		$54,424	
OPERATING DISBURSEMENTS			
Employee Benefits			$ 1,996
Salaries			24,140
Employer Taxes			1,575
Hospitalization			1,100
Office Operation			
Contribution to Academy		$3,125	
Printing, Postage, Stationery		2,500	
Telephone-Telegrams		1,200	
Audit		300	
Office (including part-time office help)		2,460	
Insurance		360	9,945
Travel			
AMA Delegate		$1,000	
Contingency (Officers—Staff)		3,216	4,216
Subscriptions, Contributions, Dues			
Delaware Public Health Assn.		$ 10	
Blood Bank		220	
AMA—Aces and Deuces		50	
Delaware Better Business Bureau		50	
Medical Society Executive Assn.		50	
Delaware State Chamber of Commerce		75	
Presidents and Presidents-Elect		25	
Contributions—Contingency		100	580
Committees and Contingency Fund			2,448
TOTAL DISBURSEMENTS			$46,000

C. L. Edwards, M.D., *Chairman*
A. E. Bacon, Jr., M.D. L. Katzenstein, M.D.
J. A. J. Forest, Jr., M.D. N. Kuseybi, M.D.
C. Walker, Jr., M.D.

PROGRAM COMMITTEE

The responsibility for this year's program is assumed by the President.

Rhoslyn J. Bishoff, M.D., *Chairman*

PUBLIC LAWS COMMITTEE

The Public Laws Committee met monthly or more frequently from December through the end of the legislative session in June and was concerned with a wide variety of legislative material. It was host to a number of individuals who were sponsoring legislation or were expert in certain aspects of legislation being considered.

The Committee continued to work in liaison with the Association of Delaware Hospitals, the Health Planning Council, and the Delaware Pharmaceutical Society. Its record on legislation supported or opposed is available to the interested reader who will consider the *Delaware Medical Journal,* July 1971, p. 196-198.

Allston J. Morris, M.D., *Chairman*
J. W. Alden, Jr., M.D. C. R. Donoho, M.D.
J. E. Belgrade, M.D. A. Z. Hameli, M.D.
N. L. Cannon, M.D. C. B. Hearne, M.D.
R. C. Corbalis, M.D. F. I. Hudson, M.D.
K. M. Corrin, Jr., M.D. M. J. McKusick, M.D.
E. S. Dennis, M.D. P. J. Mette, M.D.
G. J. Savage, M.D.

PUBLICATIONS COMMITTEE

The regular publication, on time, of our medical journal, twelve times a year, is a tribute to the hard work of a large number of persons. Our printer, Truitt Printing Company of Linwood, Pa., has continued to provide clean copy, on schedule, at reasonable rates: what higher praise could we give him? In addition to the Journal staff the Journal has many times this year called on numerous others for help with special projects. Janet Clark, Ph.D., and Mrs. Shirley Steele of the Infectious Disease Research Laboratories of the Wilmington Medical Center were of especial help in the preparation of the first of what we hope will be an annual repetition, the publication in one issue of the papers presented at the Infectious Disease Symposium. Dr. Lloyd Harrison has continued faithfully to provide us with memorial notices. Dr. David Durham we especially thank for his financial advice. Dr. Patrick

Ashley, editor of our CPC, and all the other members of our editorial board (Charles Allen, M.D., Daniel Alvarez, M.D., John H. Furlong, M.D., Carl I. Glassman, M.D., Albert L. Ingram, Jr., M.D., William D. Johnson, M.D., Leonard P. Lang, M.D., Charles L. Reese, III, M.D., Stuart W. Rose, M.D., Herman Rosenblum, M.D., and new this year, Allen C. Wooden, M.D.) have been dutiful in their ongoing, prompt and thoughtful reviews of manuscripts submitted.

We are pleased to have been reprinted in the AMA News (Dr. Harold Rafal's editorial on Preventive Medicine) and in the Wilmington newspapers (Dr. Charles Allen, Dr. Robert Flinn, Dr. Harold Rafal, Dr. Rhoslyn Bishoff, Dr. Daniel Alvarez's editorial on the shortage of doctors in downstate Delaware, and Dr. William H. Duncan).

The Clinical Research and Publications Committee of the Wilmington Medical Center is sponsoring a contest for house officers: a prize of $200 will be awarded to the best paper submitted to the *Delaware Medical Journal* during the year. Dr. Holloway is chairing the judging committee.

Th editors and editorial board consider it a privilege to serve the members of the Medical Society of Delaware. We solicit at all times, material from our members in the form of letters, editorials, papers, photographs of travel, art, book reviews, etc.

Suggestions at any time for changes, for deletions or additions, will help us edit your *Journal.*

Robert B. Flinn, M.D., ***Chairman***
J. W. Abbiss, M.D. **W. J. Holloway, M.D.**
D. G. Durham, M.D. **K. K. Kimura, M.D.**
B. Z. Paulshock, M.D.

DELAWARE MEDICAL JOURNAL

Statement of Receipts and Disbursements

	Year Ended Dec. 31 1970	Jan. 1- Oct. 1 1971
TOTAL RECEIPTS	$28,191.16	$27,232.91
TOTAL DISBURSEMENTS	$28,728.28	$25,624.49
Excess revenue over expenditure	—$ 537.12	$ 1,608.42
Savings Account	$ 7,979.84	$ 8,329.84
Due to General Fund	$ 5,000.00	$ 5,000.00

Anne E. Shane, ***Business Manager***

REPORT OF THE PHYSICIAN MEMBERS OF THE BOARD OF TRUSTEES OF BLUE CROSS AND BLUE SHIELD OF DELAWARE, INC.

David Platt, M.D. serves as a member of the Finance Committee. Alfred Lazarus, M.D. serves as a member of the Executive Committee. John M. Levinson, M.D. serves as a physician representative to the National Association of Blue Shield Plans from District IV (Pennsylvania and Delaware).

During the latter part of 1970, the Board of Trustees of Blue Cross-Blue Shield approved the agreement which physicians execute to participate with Blue Cross and Blue Shield of Delaware in the Prevailing Fee Programs and the Blue Shield Indemnity Program. If it is approved by the House of Delegates of the Medical Society of Delaware, it can be distributed to the physicians of Delaware for their individual choice to participate in the Delaware Blue Shield Plan.

There were several months of discussions concerning coverage for chiropractic services under the Blue Cross and Blue Shield contracts. After lengthy discussions and review with Plan attorneys, the Board of Trustees elected not to include coverage for chiropractic services under the Blue Cross and Blue Shield contracts.

On several occasions, your representatives on the Board requested the Plan staff to maintain constant communications with physicians concerning problems or delays in the Plan's payments for services rendered. The members felt that this type of communication was essential in that it stimulated a better relationship between physicians and the Plan.

Several discussions were held with the Claims Committee and during Board meetings concerning coverage for services at the Possum Park Emergency Center. The Board was advised that negotiations had been conducted over several months but no agreement reached concerning an acceptable fee schedule for covered services rendered by physicians practicing in that facility. The Board was also advised that the Plan was reviewing the care rendered at the free-standing facility to determine whether coverage could be provided under the Plan's certificates for services rendered in such a free-standing facility.

During the spring of 1971, the Board was advised of activities with the Delaware General Assembly concerning formulation of the Plan's position on proposed legislation concerning regulation of Blue Cross and Blue Shield rates. The Board opposed the legislation because it would create new administrative cost to Blue Cross and Blue Shield, and the State Government, and because the legislation would discriminate against Blue Cross and Blue Shield by exempting at least 35 current contracts of insurance companies from rate regulation without providing Blue Cross and Blue Shield the same exemption.

In June, 1971, the Board of Trustees decided to have individual members of the Board review eleven policy issues. Physician members of the Board were requested to review policy matters relative to contracts with physicians, what Blue Cross could do to be better prepared for impending federal legislation on health care, and how Blue Cross might most effectively encourage a greater percentage of outpatient care. As of this time, these issues have not been discussed at subsequent Board meetings; however, it is anticipated that the input from the individual members will be of great value in the Board of Trustees' examining of these issues.

Dr. David Platt presented the outline of the Medical Foundation to the Board of Trustees.

In April the Prepayment Committee recommended to the Board of Trustees of the Medical Society of Delaware that physician membership be withdrawn from the Blue Cross-Blue Shield Board of Trustees as of November 1, 1971 and the Medical Society Board so approved. In view of these actions, a nominating committee was appointed from the Blue Cross-Blue Shield Board to seek nominees for the vacancies as they occur. The President of the Blue Cross-Blue Shield Board has expressed the view that he would encourage continuance of some physician membership on the Board.

The Board is making every effort to reduce the operating costs of Blue Cross-Blue Shield.

J. H. Benge, M.D. **A. Lazarus, M.D.**
C. E. Graybeal, M.D. **J. M. Levinson, M.D.**
D. Platt, M.D.

In accepting the report of the physician members of the Board of Trustees of Blue Cross-Blue Shield of Delaware, Inc., the House approved a recommendation from the Board of Trustees of the Medical Society of Delaware to the Board of Trustees of Blue Cross-Blue Shield of Delaware, Inc. that, in the future when appointing members to their board, consideration be given to including at all times physician representation, not as representatives of the Medical Society but as community representatives. It was the feeling that it would be in the best interests of the public to have knowledgeable input from providers of health care to this policy-making body.

THE AMA DELEGATE

At the 24th Clinical Convention held in Boston, November 29-December 2, 1970, the House of Delegates:

Said AMA should provide leadership and technical assistance for state and local activities related to the November, 1971, White House Conference on Aging.

Created a permanent Section on Neurological Surgery.

Referred to the Board of Trustees a resolution calling for the AMA to work with government agencies to eliminate and prevent overlapping and duplication in medical care programs.

Urged the U.S. Department of Health, Education, and Welfare to allow the individual states to set priorities for the use of federal funds for state health care programs.

Voted to continue to work for creation of a separate federal Department of Health, whose chief officer would be a physician of Cabinet rank.

Asked legislation requiring that all medicines be dispensed in containers with child-resistant closures, except as otherwise specified by a physician.

Expanded the scope of the AMA Advisory Committee on Health Care of the American People to include multi-ethnic representation.

Referred to the Council on Medical Education a resolution urging a study to determine realistic ways to finance medical education in medical schools and teaching hospitals.

Reaffirmed AMA's 1969 stand against smoking which urged opposition "by every means" and called to the attention of Congress the incongruity of simultaneously using tax dollars to provide tobacco price supports and education program against smoking Delegates declined, however, to urge the federal government to ban all tobacco ads.

Urged establishment of ecology and pollution control educational program in the nation's schools, colleges, and communities.

AMA delegates opposed the removal of such auto restraint equipment as seat and shoulder belts and head restraints until the proposed new "passive restrain systems" which would replace them have been perfected. Delegates also urged the U.S. Department of Transportation to seek more advice from the medical community.

Challenged the White House Conference on Children to improve the quality of life for children in the coming decade. Delegates urged that the Conference act to place special emphasis on assuring that all babies are born healthy.

Physician membership on health advisory councils drew the solid endorsement of Delegates. The House approved a resolution which called upon the AMA to "bring to the attention of all state medical societies the importance of having interested practicing physicians serve on state, regional, and local health advisory councils and similar groups in their respective areas," and to proper officials in government.

Modified provisions of the AMA's Physician's Recognition Award by making osteopathic physicians eligible for the Award, providing they have met all the regular requirements.

Approved a resolution encouraging the use of Current Procedural Terminology by all physicians. The resolution called for an educational program to "assure the use of CPT to be developed by AMA for use by state, county and national specialty societies," adding that such a program "include a mechanism to assure that coding and terminology used by physicians accurately reflect current medical practice."

Reaffirmed AMA policy that reimbursement for physicians' services under private and governmental financing programs be on the basis of usual, customary, or reasonable fees, determined exclusively by a process of peer review.

Reaffirmed strong AMA opposition to chiropractic as an unscientific cult, and called for exclusion by the United States Congress of chiropractic services from all federally-assisted health care programs.

Called for a nationwide moratorium on licensure of any additional health occupations. ,

Recorded itself as approving services rendered by a physician's trained assistant, licensed professional nurse, or licensed practical nurse if rendered under the "supervision, control, and responsibility of a licensed physician."

Reaffirmed AMA policy of opposition to the legalization of marijuana.

At the 120th Annual Convention of the AMA held in Atlantic City, June 20-24, Wesley W. Hall, M.D. was installed as President. Charles A. (Carl) Hoffman, M.D., from West Virginia, was chosen President-Elect. The House of Delegates took the following actions, among others:

Separated the Section on Psychiatry and Neurology into two sections — the Section on Psychiatry and the Section on Neurology.

Amended the by-laws, under "Active Members" to create a new membership classification. Active members now may be either Regular Members or Direct Members. There is no change in the definition of Regular Members. Direct Members include (1) service members, (2) physicians employed by federal agencies, and (3) interns and residents.

Elaborated existing policy regarding the right of access to medical care by adopting this statement: It is the right of every citizen to have access to adequate medical care, but it is the responsibility of the citizen or of society to seek it. The American Medical Association will use all means at its disposal in an endeavor to make adequate medical care available to meet the needs of each person. In the spirit of inheritance of the Oath of Hippocrates, the AMA reaffirms its obligation to humanity. In this effort, the AMA cannot assume the responsibilities of government or the individual citizen. The AMA also recognizes the right of the physician to choose whom he will serve and the conditions under which he will render this service. These are integral essentials in the delivery of quality medical care."

Increased emphasis on the responsible use of drugs for therapeutic purposes, both by the public and by physicians.

Resolved to "urge all physicians to limit their use of amphetamines and other stimulant drugs to specific, well-recognized medical indications."

Recommended increased attention to alcoholism and drug abuse in the curriculum of medical schools.

Asked that laws and regulations be modified to recognize alcoholism and drug dependence as illnesses.

Urged closer liaison between medical societies and law enforcement and licensure bodies to deal jointly with the problem of physicians suspected of professionally misusing or personally abusing drugs.

Adopted policy that the teenage girl whose sexual behavior exposes her to possible conception should have access to medical consultation to obtain the most effective contraceptive advice and methods consistent with her physical and emotional needs and her physician's best medical judgment, provided that definite effort is made by the physician to obtain consent from the minor patient's parents or legal guardian wherever possible.

Urged, in consequence of its concern with the spread of venereal disease, that medical societies be asked "to support education of patients and the public through more extensive and more imaginative use of all available media and through school curricula;" that the AMA "reiterates its support and cooperation with the National Commission on Venereal Disease in order to hasten the control of these diseases;" and that the AMA "strengthen in every way possible research efforts toward the development of vaccines for the active immunization of our population against venereal disease."

Approved the recommendation of the Board of Trustees and its Council on Medical Manpower that the term "physician's associate" should be used only to denote another physician.

Considering the use of assistants in medical practice, resolved that "the physician may properly delegate technical procedures to an allied health worker" but affirmed the principle "that whatever privileges may at any time be granted either to allied health workers or to independent limited practitioners, by law or otherwise, such grant in no way circumscribes the physician's authority in that field and in no way restricts the practice of medicine by the physician."

Approved a by-laws amendment providing that the AMA Board of Trustees shall determine those specialty societies that will appoint members to newly approved section councils and the number of members to be allocated to each society.

Approved outpatient surgery "under general and local anesthesia for selected procedures in selected patients as good medical practice."

Urged the removal of legal barriers to the distribution of birth control information and treatment.

Supported residency training in community hospitals.

Reaffirmed its 1970 position opposing "programs that utilize potentially carcinogenic pesticides without the prior approval and coordination of all federal agencies responsible for environmental health and ecology."

H. Thomas McGuire, M.D., ***Delegate***

DELAWARE ACADEMY OF MEDICINE

As your representative to the Delaware Academy of Medicine this past year, I have kept abreast of the activities of the Academy.

The Library continued its evening hours.

Limited funds prevented the Student Financial Aid Committee from rendering as much assistance as desired. Activities of this Committee are of a significant value to our community.

Again, the Academy was co-sponsor of the Warren Lecture and the Infectious Disease Symposium. A Symposium on "Medicine, Society and the Law in a Changing Era" is planned for November 14th.

Increasing cost of maintenance necessitated a review of charges for use of the Academy's facilities.

Doctor Charles E. Wagner was honored at the Annual Social Meeting. Mr. Barry Bishop was the speaker at the meeting and discussed his personal experience in the conquest of Mt. Everest.

The Academy is an unique institution for our State and deserves full support of the medical and dental profession. A membership drive is presently being conducted.

Norman L. Cannon, M.D., ***Representative***

REPORTS OF SPECIAL COMMITTEES

WOMAN'S AUXILIARY TO THE MEDICAL SOCIETY OF DELAWARE

Thank you for inviting me to present to you the report of your auxiliary. This report is a compilation of the combined efforts of 273 members in our three organized counties. It includes the last six months of Mrs. Joseph Elliott's tenure of office as president, from October, 1970, through April, 1971. As the current president of your auxiliary, I have the pleasure of presenting this report.

Our challenge as a voluntary organization is to learn to work efficiently with the community agencies in meeting the public's health needs.

Our goals this year are to keep abreast with the national concern regarding health, the recruitment and promotion of health careers, supplying health manpower, ecology and providing money for medical research.

This is quite an impressive agenda, but we are progressing toward a successful culmination of all of these goals.

Leadership is not a privilege, not a luxury, but an obligation, and we are most grateful to the dedicated committee chairmen who work diligently in an individual manner, or cooperatively when committees overlap in a mutual direction. Case in point is 'drug abuse', a problem of paramount importance today. Our "Children and Youth" committee educates the young people about the dangers of drugs; those who have become victims become a "Community Health" problem; and those who have reached the point of needing rehabilitation become the problem of "Mental Health" committees.

Regarding drug abuse, your auxiliary has encouraged two business establishments to insert a drug abuse pamphlet in each shopping bag leaving their store. We realize this is a meager dent in this gross health problem, but it is a beginning.

A very successful day-long mental health workshop was sponsored by your auxiliary at the Hospital for the Mentally Retarded in Georgetown, Delaware, in the spring. This was open for physicians' wives, the parents of inmates, and those who work in the hospitals, schools and day centers especially designated for children with mental retardation.

Our mental health program has also continued its emphasis on volunteer services. We are very much a part of the Fall Fair for patients at the State Hospital in Farnhurst, providing prizes and manpower at the booths, and the Christmas season finds our members collecting and wrapping gift packages for distribution to forgotten patients. A sizeable monetary donation is also included for 'Operation Reindeer."

Our International Health Committee still functions on the international scene by collecting pharmaceuticals, drug samples, and also office and hospital equipment for medical missions in this country and abroad. Several drug samples are especially sorted for distribution to our state mental institutions at their request. If some of you wonder where your old shirts go, some of our diligent members have converted them into hospital gowns which are distributed to home-bound patients by the Visiting Nurse Association.

Also on the international level, "Project Hope" was the beneficiary of many auxiliary man hours invested in collecting new and used children's shoes, and several hundred pounds of orthopedic equipment including braces, appliances, artificial limbs, canes and crutches, which were personally transported to the "Hope" warehouse in Beltsville, Maryland.

A highly successful program on Environmental Health was sponsored by your auxiliary, bringing to our "air pollution" panel, members of national government, local government, the Medical Society and leaders of industry in this highly industrial area. The discussions were indeed lively and presented to a concerned audience in the packed Academy of Medicine auditorium in Wilmington.

During the school year, your auxiliary members screened for ambliopia 1,517 children under five years of age who attend the Headstart and pre-kindergarten programs. We must stamp success on this program when we can report that of the fifty-one referred to specialists, many were found to be in need of some visual assistance, and nineteen were found to be in urgent need of treatment.

AMA-ERF was richer by $1,404.77, which the auxiliary raised through the sale of rosebushes, fruit cakes, toys, note paper and memorial donations.

During the year your auxiliary answered the Medical Society's request for assistance with the Rubella vaccination campaign in Sussex County, and also manned the information centers in New Castle County during Health Week. At your rquest, I attended the AMPAC meeting in Washington, D.C. as a member of the Delaware contingent.

Our senior citizens look forward to the afternoon get-togethers at their social centers when our auxiliary members take over as hostesses, providing entertainment and refreshments.

There is not a service organization or a health organization in this state that does not have a member of this auxiliary holding an active position on the Board of Directors or executive committees or heading its volunteer roster. We are also much in the fore in the volunteer field, and this helps to keep us abreast of the needs and challenges of our communities, answering those we can and helping to implement those of other organizations, to better the health picture in Delaware.

Of all the individual committee reports, I have deliberately left Health Careers to the last. I hope you will agree with me that the reason is valid.

The auxiliary has been offering scholarships to prospective nursing students since our program was instigated in 1950.

We have granted 140 full or part scholarships, and have provided funds totalling $29,406. All of this money has been outright grants — not loans. All of this money has been raised by your auxiliary by various and sundry means. The results were achieved by the untiring efforts of many.

I would like to refrain from mentioning names in this report, but it is important that I tell you that one of the first chairmen of this Scholarship Committee was Mrs. Sylvester Rennie. Margaret became frustrated when our program became better known and she found herself receiving many more applications than there were funds available. Like most wives, she appealed to her husband to come up with a solution to her dilemma.

Doctor Rennie, who was an active Rotarian, approached the Rotary Club of Wilmington and appealed to them to join our auxiliary in promoting paramedical recruitment, particularly by providing funds specifically for nursing education. He was most persuasive and consequently successful, and your auxiliary was called upon to help set up their program in 1952.

Since that time, we have completely handled all the paper work for this Rotary Club program. We notify all prospective students, screen all applicants, select the recipients, and provide progress reports on the successful applicants throughout the training period.

To date, 169 grants have been provided by the Rotary Club of Wilmington, totalling $47,550.

This is a most significant achievement, and certainly Doctor Rennie's efforts and dedication to the needs of the community should be recognized. He has made the medical community as well as the community as a whole, the beneficiaries of his enthusiasm and foresight by being instrumental in providing the medical manpower which is so essential to a good total health picture.

We feel we are much in his debt, and because of this, your auxiliary has pledged itself to promote the "Sylvester W. Rennie Scholarship for Nursing Education." We ask the Medical Society to join us and help provide the funds to make this a fitting tribute to the efforts of one of your fellow physicians whose look beyond the present will continue to benefit the community he loved and served so well.

This completes the report of your auxiliary.

Nothing is as contagious as enthusiasm, and enthusiasm is indeed the implementing force in our auxiliary. Our medical auxiliary is a service organization. We produce no tangible product. Our accomplishments are our only production. We are an active part of the health care team in Delaware, and it is in this area that our activities have been, and will continue to be, meaningful and noteworthy.

Mrs. James P. Aikins, *President*

ADVISORY COMMITTEE TO THE WOMAN'S AUXILIARY

The committee has had no formal meetings but has maintained a very close relationship with the members of the Woman's Auxiliary Executive Board. We have been available for advice, counsel and encouragement.

The Auxiliary should be commended for the help and support extended to "Project Hope" by the donations of several hundred pairs of new and still serviceable used shoes, orthopedic braces and appliances.

We have encouraged them to proceed with the promotion of the "Sylvester W. Rennie Memorial Scholarship for Nursing Education" and have pledged them our support.

This committee feels grateful to the Auxiliary for their performance in the fields of community health and community service. Cooperative efforts between the Board of Trustees of the Medical Society of Delaware and its Auxiliary can only result in mutual benefits.

James P. Aikins, M.D., *Chairman*
Edward T. O'Donnell, M.D.
Walter H. Comer, M.D.
F. B. Lane Haines, M.D.

COMMITTEE ON AGING

A statewide White House Conference was held at the University of Delaware on May 17 (your chairman planned to attend but failed when his car failed completely).

The health aspects as summarized in the Senior Center Focus on Aging were "Extensions of Medicare and Medical Benefits; Some Form of National Health Insurance for All Ages; Massive Educational Programs on Available Health Services." Representative Pierre S. duPont, the keynote speaker, left after his address to introduce a bill in Congress removing earning limitations under current Social Security laws. He also stated he would fight for formation of a standing committee on aging in the House.

The National White House Conference on Aging will be held in November. Doctor Alfred Shands is Delaware's representative to this meeting. The charge to the conference is to produce a plan of "national action to strengthen the means of older people for independent living and improved use of their talents and to lessen their isolation and to increase their participation in family and community life."

Report B of the Council on Medical Services of the AMA stated "that it is incumbent on organized medicine to insure that proper emphasis is placed on improving and maintaining the health of the aging."

To provide guidance for the delegates to this Conference ten concepts were listed and explained in detail in Report G of this same Council on Medical Services at the 120th Annual AMA Convention. In summary these are as follows:

1. There are no special geriatric diseases, but ill health affects the elderly more adversely than the young.
2. Emphasis on preventive medicine since the majority of older citizens are not sick.
3. Encouraging usefulness in the family and community to reduce emotional problems and improve their general health.
4. Improvement of health of all by periodic health appraisals, planned exercise, activities to stimulate thinking, diet to avoid obesity and malnutrition, modification of excesses such as tobacco, alcohol, and drugs, and participating in other preventive medicine programs.
5. Financial protection from catastrophic costs and community development of home health services to avoid more costly institutional care.
6. No selective social discrimination against the aged solely on the basis of age.
7. Equal opportunities for middle-aged and older workers for gainful employment.
8. Capable workers who desire to postpone retirement should be encouraged by modification of the work-income test under Old Age and Survivors Insurance Program and by adoption of flexible retirement policies by both government and industry.
9. Voluntary pension system transferable among employers (vesting) should be devised for expansion and improvement of private pension coverage.
10. Final formula for fulfillment for the aged should include (a) independence and self-esteem; (b) opportunities for work, part-time or full-time, on a paid or volunteer basis; (c) continued meaningful participation in family and community life; (d) adequate housing; (e) ability to enjoy leisure time and participation in recreational activities; (f) continuing personal self-appraisal; and (g) availability of protective services and medical and nursing care.

William D. Shellenberger, M.D., *Chairman*
R. H. Beckert, M.D. **O. A. James, M.D.**
A. A. Boytar, M.D. **J. S. McDaniel, M.D.**
S. G. Elbert, Jr., M.D. **H. L. Reed, M.D.**
M. E. Traynor, M.D.

COMMUNITY COUNCIL ON EMERGENCY SERVICES

The Community Council on Emergency Services has been very active during the past year. Meetings have been held on a regular basis every month with very good attendance.

Active members of the Council include the Representatives of each one of the city hospitals, the Wilmington Bureau of Fire, the Delaware State Osteopathic Medical Society, the Medical Society of Delaware, the Wilmington City Police Department, the New Castle County and Volunteer Ambulance-Rescue Services, the Delaware Society of Anesthesiologists, and the Delaware State Police.

Many subjects have been discussed, including the necessary traffic changes to facilitate the transport of victims and parking rules and regulations around the Emergency Wards to expedite the delivery of the victims. The Council has actively supported the establishment of a school for the training of ambulance attendants and drivers, and the Medical Subcommittee has revised the first aid program now in use with the courses.

Another item, on which the Council has been very active, is the establishment of Code 10 which assigns numbers to various types of emergencies. It has been revised and is being brought up-to-date at the present. The Council had played a major role in supporting the acquisition of the State Police Helicopter, now in use in Delaware. It has helped to coordinate the function of the helicopter with the emergency services. It has helped plan and aid the Statewide Disaster Exercise held during the past year, and it deals frequently with the complaints brought up by the physicians, hospitals, or ambulance attendants.

L. Mario Garcia, M.D., *Coordinator*

DRUG ABUSE COMMITTEE

The members of this Committee have been active throughout the year by their personal activities with the drug problem. They have consulted with State, County, and City governments on various drug programs. We have assisted the State program in the expansion of the Drug Abuse Clinic at the Wilmington Medical Center and in helping organize an outpatient clinic (SODAT), and an inpatient facility (Florence Crittenton Home), and in organizing an inpatient program (Little Flower). We have talked in numerous schools and at public meetings, and have served on numerous advisory committees.

We had one formal meeting during the year. At that meeting we decided on the following: (a) to cooperate with the National Commission on Marijuana and Drug Abuse and poll our membership this year on their opinion concerning marijuana and next year on their opinion concerning drug abuse in general; (b) to sponsor a series of articles in the Delaware Medical Journal focusing attention on physicians, on their manner of prescribing drugs, and whether or not it relates to drug abuse. It is the hope of the membership of this Committee that more physicians in our Medical Society will become active in the problems of drug abuse.

William J. Vandervort, M.D., *Chairman*

T. M. Alatur, M.D. **J. A. Glick, M.D.**
L. O. DeBernard, M.D. **W. Omans, M.D.**

COMMITTEE ON EDUCATION

The Continuing Education Seminars jointly sponsored by DIMER (University of Delaware, Thomas Jefferson University, Wilmington Medical Center) and the Medical Society of Delaware were a significant success for 1970-1971. A personal visitation by the chairman to all the hospitals participating in the program indicated this fact. In addition, similar and in some instances expanded programs have already been prepared for the 1971-1972 academic year. It is noteworthy that in the coming academic year Delaware speakers in addition to the Jefferson faculty will be provided to the different institutions downstate as well as to the New Castle County hospital staffs. This is a bold and direct step in recognition of the caliber of physicians that practice medicine throughout our State.

In addition, the committee has been kept fully informed by the chairman of the progress of the Continuing Education program and in addition has been advised about the Ad Hoc Committee to review the project on continuing education that was presented to the Greater Delaware Valley Regional Medical Program by the Jefferson Medical College. As chairman of your Education Committee, I am a member of this review committee.

No formal meetings of the committee were held in the past year, but every effort was made to keep the committee informed of educational activities. This committee has made no study or recommendation as regards nurse clinicians or physicians' assistants as this has been handled by the Committee on Public Laws.

William H. Duncan, M.D., *Chairman*

C. Allen, M.D. **G. B. Heckler, M.D.**
G. K. Berger, M.D. **D. W. MacKelcan, M.D.**
G. Botte, M.D. **M. Oz, M.D.**
J. Gelb, M.D. **B. Z. Paulshock, M.D.**
R. C. Hayden, M.D. **J. C. Straughn, M.D.**

ENVIRONMENTAL AND PUBLIC HEALTH COMMITTEE

After considering the proposed Tocks Island Dam project to be built on the upper Delaware River, the Committee recommended to the Board of Trustees of the Medical Society of Delaware that we request Congressional approval be withheld from the project until a thorough study is made as to the project's effects on the health of the community, the water supply, and the ecology with notification of Board action to be forwarded to Senators Boggs and Roth, Congressman duPont, and Governor Peterson.

Frank T. O'Brien, M.D., *Chairman*

E. D. Bryan, M.D. **L. P. Lang, M.D.**
J. DeLaurentis, M.D. **E. G. Orton, M.D.**
E. F. Gliwa, M.D. **D. J. Reinhardt, III, M.D.**
J. M. Hofford, M.D. **H. F. Wendel, M.D.**

FORMULARY ADVISORY BOARD

The time has come to review the relationships between Pharmacy and Medicine, and for both professions to rededicate themselves to a cooperative effort directed toward the best interests of the patients we both serve.

There are three basic ingredients in this thesis:

1) Pharmacists are highly trained experts in the drug field, and just re-labeling of material supplied by pharmaceutical manufacturers not only fails to

satisfy them intellectually, but constitutes a waste to society of an expertise which could be put to better use.

2) The problems of the delivery of health care today are largely those of manpower, both availability and distribution, and to the extent that trained allied health professionals can play a part in solving these problems, a significant and proper role should be found for the profession of pharmacy.

3) The cost of health care today is receiving increasing attention from many concerned sources, and to the extent that this applies to drugs and that drug costs can be ameliorated with due regard to quality not only of drugs themselves but of health care as a whole, pharmacists and physicians should be able to sit down and work out together the means of accomplishing such a goal.

Now what has been the course of events to this time? In recognition of the three ingredients mentioned above, a liaison committee between Delaware pharmacists and physicians was created several years ago, out of which grew the Delaware Formulary Advisory Board because the pharmacists felt that a method of controlling costs and preserving quality should receive first priority. The liaison committee was temporarily disbanded, and the Delaware Formulary Advisory Board, with Dentistry and Osteopathy added to Medicine and Pharmacy, undertook to develop a voluntary formulary for the use of prescribers and dispensers as an educational tool to help provide quality drugs at reasonable cost to the citizens of Delaware. The intent of the physicians involved was to develop an informational source so that both prescribers and dispensers could more intelligently furnish patients with quality drugs at reasonable cost. It developed that the intent of the pharmacists involved was to transfer to the community the bid system used in hospital pharmacies with the goal of limiting retail pharmacists' inventory to those brands selected by the Delaware Formulary Advisory Board. Two barriers emerged. First, pharmaceutical manufacturers refused to submit any bids when requested, saying that would be in violation of the Robinson-Patman Act. Second, the pharmacists were informed that the mere publication of a list of drugs and brands selected for community use might expose the Delaware Formulary Advisory Board to the possibility of suit through the Sherman Anti-Trust Act. It was then decided that, since a state agency is less likely to be sued under anti-trust legislation than a private group, we would limit the experiment to recipients of aid under Title XIX (Medicaid), with the Department of Health and Social Services as a protective cloak. (It should be remembered here that the whole project of the Formulary Advisory Board was originally meant to be an experimental and pilot program to run for one year, and to be continued and expanded only if analysis at the end of that time indicated some significant achievement of stated goals.) That this be done was approved by the Medical Advisory Committee to the Division of Social Services, and this seemed to the physicians involved, at least, to satisfy the conditions required to set up an experimental program which might or might not at some future time be expanded under suitable conditions to cover all the citizens of Delaware. Nothing was ever discussed about implementing any part of this program through the medium of state legislation, but so dissatisfied were the pharmacists involved in limiting this experiment to Title XIX patients and so dedicated were they to the proposition of a statewide community formulary, and so convinced were they that the latter could not be done without the legal protection of state legislation, that unilaterally they waited until the next to the last day for the introduction of new legislation, found a sponsor, submitted enabling legislation, and after the fact notified the other professions supposedly playing a part in these decisions. This is not the kind of action which encourages cooperation between professions toward accomplishing the really desirable goals previously outlined. We believe that what we originally set out to do can be accomplished by voluntary, educational, and non-legislative means, and indeed that all such means in any area of endeavor should be thoroughly utilized before casting it in the rigid structure of statutory acts.

Unfortunately this legislation appeared on the surface to legislators like "motherhood stuff" and passed the Senate in the last session with no difficulty. It is due to come up in the House in the next session.

We would at this point call your attention to a resolution passed at the 1970 meeting of the House of Delegates of the Medical Society of Delaware, of which the last resolve reads:

"Resolved, that this House of Delegates reaffirm its support of the Society's cooperative efforts with pharmacy and others through the Delaware Formulary Advisory Board, and in addition instruct the trustees to devise other mechanisms through which medicine can more fully utilize the knowledge and expertise of pharmacy for the benefit of the patient without the improper delegation of medical discretion and judgment."

We are genuinely interested in the accomplishment of progress toward the three ingredients introducing these remarks. This can be done only by cooperation, and not by having the very people we are trying to help precipitously flying off in the direction of unilateral action because they have made up their own minds ahead of time what they will achieve "come hell or high water."

We therefore recommend that the pharmacists withdraw the formulary legislation waiting for action in the House of Representatives, that the existing Delaware Formulary Advisory Board be disbanded, and in the spirit of the quoted resolution from last year's House of Delegates meeting, that a broad-based liaison committee between medicine and pharmacy be developed for the purpose of addressing itself to the solution of the many problems and the realization of the many opportunities which confront both of our professions. In no other way can the best interest of the public be served, and in no other way can pharmacy avoid its real fear as recently expressed by the President of the American Pharmaceutical Association when he said: "Every year that passes brings us that much closer to the day when we will either find pharmacists as full fledged partners on the health team or as relics of a former era in health care delivery."

Walter H. Comer, M.D.
Kazuo K. Kimura, M.D.
William O. LaMotte, Jr., M.D.

GRIEVANCE COMMITTEE

The Committee is pleased to report that no cases for grievance have been brought before the committee during the year 1971. This reflects the excellent manner in which the individual Grievance Committees of the several county medical societies have functioned during the past year. The Grievance Committee of the Medical Society of Delaware commends the county society Grievance Committees for the efficiency and excellence of their work during this past year.

Daniel J. Preston, M.D., *Chairman*
J. B. Baker, M.D. **H. T. McGuire, M.D.**
R. B. Glidden, M.D. **C. M. Moyer, M.D.**
H. H. Stroud, M.D.

HEALTH CARE DELIVERY

The Health Care Committee continues to be a very broadlbased committee with many activities of the physicians involved being relative to the function of this Committee, but not recorded in any official minutes of the Committee or each of the Task Forces. The Committee, as a whole, has not met this year and continues to be divided into nine Task Forces. The actions of each of these are the major substance of this report.

All physicians in Delaware continue to be encouraged to assist in giving advice about and aiding an adequate Health Care Delivery system that will have not only adequate quantity, but also quality. This Committee has functioned under the premise that it would be a clearing-house for information and a mechanism to avoid duplication of effort by physicians as well as to stimulate and motivate activities of physicians in this complex area of health care. It has also given us an opportunity to open lines of communication and participation with those outside our Society.

Task Force No. 1 — Population Growth and Control — Family Planning
William D. Johnson, M.D., Chairman
No report

Task Force No. 2 — Careers Development and Training — Allied Health Personnel
Henry H. Stroud, M.D., Chairman

The Task Force has met three times since the last Annual Meeting of the Medical Society, and the first meeting on November 17, 1970 concerned itself with the need for a change in legislation to permit allied health personnel to perform their duties under the direction of a licensed physician. At that time we were also waiting an Attorney General's opinion on what had to be changed in the Medical Practice Act to allow physicians' assistants to practice in Delaware.

The second meeting of the Task Force was held on March 2, 1971. At that time two legislators were interested in introducing legislation that would modify the Medical Practice Act, and the Committee accepted the following wording: "Nothing contained in any of the Sections or Subchapters of this Chapter shall be construed to prohibit a Physician's Assistant or Surgeon's Assistant from rendering medical services, if such services are rendered under the supervision and control of a physician or surgeon. Physicians' Assistants, Surgeons' Assistants, and all other physician support personnel can only work under a physician if they have been approved by the Board of Medical Examiners." Unfortunately when the legislation was passed later in the year, this last sentence was not included.

At the March meeting Doctor Paulshock introduced by letter a proposal for a short course for training "Nurse-clinicians" through the Wilmington Medical Center. Since Doctor Paulshock was not present, no action was taken.

The Committee last met on July 27, 1971. By that time the Medical Practice Act had been modified, and it was signed into law on July 5th by Governor Peterson. Concerns were expressed that no provision was made for anyone to consider the qualifications and/or training that the so-called physicians' assistants had received.

At about this time the American Medical Association put out an informational bulletin on the current status of the "Physician's Assistant Concept." It pointed out that the AMA strongly supports the concept of innovation and experimentation in utilizing health manpower, but they were concerned that no uniform mechanism or standard for national recognition of physicians' assistants has been established. The AMA indicated that a great deal of work had to be done in this area before there could be national approval of the physician's assistant and the educational programs.

At this time we feel that three areas of concern must be brought to the attention of the Board of Trustees of the Medical Society of Delaware and these are as follows:

1. The profession and the public must be protected by providing a method for the Board of

Medical Examiners to review and certify the basic qualifications of an assistant.

2. A more formal definition of the scope of practice or more formal guidelines as to the duties of a physician's assistant must be developed. With the present programs that have proliferated throughout the United States, so-called physicians' assistants have varying levels of training and have various levels of capabilities because of the variation in the competence of the individuals and because of the varied training programs. It is felt that a committee of the State Board of Medical Examiners should review the qualifications of each person being proposed as a physician's assistant and define carefully the limits under which he may operate.

3. We further feel that a committee of the Board of Medical Examiners could consider the training programs that are available for training physicians' assistants and should require the consideration by this committee of any training program proposed by any organization in the State of Delaware.

I think this suggestion points out that we now have a law which permits physicians' assistants, but now we, the Task Force on Allied Health Personnel, are concerned that unqualified personnel may enter the field and that training programs will not be adequately assessed by the State Board of Medical Examiners, thus permitting inadequately trained personnel to enter the field.

Task Force No. 3 — Education, Supply and Distribution of Physicians in Delaware
G. Barrett Heckler, M.D., Chairman

The supply and distribution of physicians in Delaware is just part of a national problem. We have not escaped our share of the problem.

The Task Force assigned to this question has no built-in resources for study of the problem. We have, therefore, become a clearing-house for multiple studies that are being carried on by other agencies with which you are familiar. We await many of these reports and studies.

I believe that our best potential that might later assist us in alleviating our problem lies with the affiliation of the Wilmington Medical Center with the University of Delaware and the Thomas Jefferson Medical School. By 1972 we will start to receive students for clinical training at the Wilmington Medical Center, and the numbers will increase considerably each year. This should eventually supply interns and residents to the Wilmington Medical Center, and a high percentage of them eventually will most likely practice in Delaware. This is by far the greatest hope that we have to overcome our physician shortage in the State of Delaware.

Task Force No. 4 — Comprehensive Health Care Centers — Family-Oriented or Group Practice and Health Care for Disadvantaged Groups and Areas
Jack Gelb, M.D., Chairman

Two efforts to deal with the problems of unmet medical needs in the Wilmington area have come into operation during the past year with the Northeast Medical Group working in the First State Service Center, which includes 14 general practitioners along with other support personnel and the Southbridge Medical Activities Center with 15 physicians giving time and service. A meeting is scheduled for September 8, 1971 to pursue further the objectives of the Task Force for the coming year.

Task Force No. 5 — Liaison with Executive-Legislative Government — Health Programs and Financing
William O. LaMotte, Jr., M.D., Chairman

Much of the activity of this Committee has been handled by the Public Laws Committee and is covered elsewhere in the report to the House of Delegates.

Task Force No. 6 — Ambulatory Health Care Facilities Development
Edward F. Gliwa, M.D., Chairman

There are several groups doing planning in this area, one of which is the Governor's Advisory Council for Comprehensive Health Planning, which is meeting late in September to discuss and review the Task Force reports and to develop further a model of health care for Delaware, which should be ready early in October.

Task Force No. 7 — Maternal-Child Health Care Facilities and Preventive Health Care Centers and Programs
Calvin B. Hearne, M.D., Chairman
No report

Task Force No. 8 — Extension of Hospital Facilities and Services into Neighborhoods
William H. Duncan, M.D., Chairman

The ambulatory services of the Wilmington Medical Center continue to have involvement in participation and planning as well as active physician participation in neighborhood health care systems. The Northeast State Service Center renders the following care:

Doctors' Appointments
Pharmacy Services
Well-Child Clinic
Speech and Hearing
Family Planning
Vocational Rehabilitation
Dental Mobile Unit
Drug Abuse
Division of Social Services
Food and Nutrition
  Program

  - Mental Hygiene Clinic
  - Mental Hygiene Association of Delaware
  - Youth Corrections
  - Alcoholism Services
- Middletown Health Clinic:
  - Health and Social Service Center
  - Nurses, Sanitarian, Detached Department of Social Service Workers
  - Dentists (Dental clinic every day)
  - Pre-Natal Clinic, Post Partum Care
  - Family Planning Clinic
  - Well-Child Health Conference
  - Chest Clinic
  - Mental Hygiene Clinic
  - Comprehensive Clinic
  - Bedside Care, Home Visiting
  - Geriatric Aide
  - Vocational Rehabilitation
  - Psychiatric Social Worker
- Belvedere State Service Center:
  - State Agency Health-Related Services
  - Division of Social Services
  - Family Planning Clinic
  - Mental Hygiene Consultant Service
  - Mental Hygiene Clinic
  - Vocational Rehabilitation
  - Visiting Nurse Association
  - Alcoholism Clinic
  - Drug Abuse (on call)
  - After-Care Juvenile Correction
  - Dental Mobile Unit
- Southbridge Medical Activities Center
  - Primary Care, Physicians' Service
  - Counselor from Planned Parenthood
  - Psychiatric Service
  - Vocational Rehabilitation Counselor
  - Well-Baby Clinic
  - Lab Testing
  - Home Visiting

Task Force No. 9 — Development of a Plan for a Prepaid Group Medical Practice
David Platt, M.D., Chairman

This Task Force has been making progress. The plan consists of three components, all parts of a proposed Delaware Foundation for Medical Care:

1. An administrative structure to accept contract from groups for prepaid comprehensive care, but permitting individual participating physicians to be paid on a fee-for-service basis.

2. An ancillary medical personnel component to extend the capability of the physicians and enable them to give more care. The Foundation will define the need for specific paramedical personnel, will assist and coordinate their training by proper local institutions, and then use them under physician supervision for health maintenance, diagnostic testing, and health care.

3. A utilization review program by peers to prevent over-utilization and promote optimal utilization of all health facilities, including hospital inpatient, office, and nursing and extended-care facilities. It is anticipated that savings resulting from this part of the program will help fund the other parts.

Herbert M. Baganz, M.D., *Chairman*

J. W. Alden, Jr., M.D.
C. Allen, M.D.
M. V. Andersen, Jr., M.D.
K. Anstreicher, M.D.
J. Beebe, Jr., M.D.
J. E. Belgrade, M.D.
R. J. Bishoff, M.D.
W. W. Briggs, M.D.
J. L. Campbell, M.D.
Mr. H. F. Camper
N. L. Cannon, M.D.
Dean Mary K. Carl
W. H. Comer, M.D.
R. C. Corbalis, M.D.
Mr. L. Davis
L. O. DeBernard, M.D.
C. A. Depfer, D.O.
H. Dowling, M.D.
W. H. Duncan, M.D.
J. J. Egan, M.D.
K. L. Esterly, M.D.
L. B. Flinn, M.D.
R. B. Flinn, M.D.
Mr. C. T. Foster
R. W. Frelick, M.D.
A. Gelb, M.D.
J. Gelb, M.D.
J. L. Giliberto, D.O.
C. I. Glassman, M.D.
E. F. Gliwa, M.D.
C. E. Graybeal, M.D.
Mr. R. R. Griffith
Mr. E. Hare
C. B. Hearne, M.D.
B. Heckler, M.D.
F. I. Hudson, M.D.
J. F. Hughes, M.D.
M. S. Hurm, M.D.
A. L. Ingram, Jr., M.D.
Mrs. Arva Jackson
W. D. Johnson, M.D.
W. O. LaMotte, Jr., M.D.
L. P. Lang, M.D.
R. Lennihan, Jr., M.D.
D. A. Levitsky, M.D.
J. W. Maroney, M.D.
Mr. Ronald McCoy
M. J. McDermott, Jr., M.D.
L. C. McGee, M.D.
M. J. McKusick, M.D.
E. R. McNinch, M.D.
C. B. Middleton, M.D.
M. H. Mires, M.D.
A. J. Morris, M.D.
E. G. Orton, M.D.
B. Z. Paulshock, M.D.
D. Platt, M.D.
H. S. Rafal, M.D.
C. L. Reese, III, M.D.
D. J. Reinhardt, III, M.D.
C. S. Riegel, M.D.
B. B. Rose, M.D.
L. Rosenbaum, M.D.
H. Rosenblum, M.D.
D. E. Saunders, M.D.
D. L. Schafer, M.D.
A. R. Shands, Jr., M.D.
Mr. T. S. Spiker
H. H. Stroud, M.D.
Mr. J. P. Tyler
C. Vileisis, M.D.

LIABILITY INSURANCE COMMITTEE

The Liability Insurance Committee held an organizational meeting early in 1971. Various approaches to the problem of liability insurance were discusssed in general terms, and the consensus of the Committee was that the most effective approach to the whole problem would be some legislative remedy.

Several months later the Society was approached by the Aetna Insurance Company, and the Liability Insurance Committee met with representatives of this company to hear a proposal regarding the medical liability insurance package which would be guaranteed to be available to members of the Society with few exceptions for a period of five years. The program includes peer review, which permits members of the Society to aid Aetna in screening all physicians applying for membership in the plan with a view to reducing frequency of claims. The members of the Committee who had heard this proposal were unanimous in the feeling that the Society should proceed along these lines. The proposal was presented to the Society Board of Trustees by the Chairman of the Committee, and a decision to proceed was made.

The Chairman of the Committee has subsequently met again with representatives of the Aetna Insurance Company and the Insurance Commissioner in order to clear up several points of possible misunderstanding, and at this time final arrangements are being made for the implementation of this program on a voluntary basis for members of the Society with a target date of either November 1 or December 1 of this year. It is expected that brochures explaining the program in full will be mailed to all members of the Society in the near future.

A representative of the Committee, Dr. Gibbs, has also met this summer with the Health Planning Council, which is taking an active interest in various approaches to deal with the whole problem of medical liability. This group plans to deal initially with some of the legislative problems, particularly in the area of enabling legislation for arbitration procedures.

Thus, at the present time, this Committee feels that the Aetna program will be a fairly satisfactory stop-gap measure to make certain that all qualified physicians are able to obtain adequate liability coverage while other long-term measures to deal with the total problem are being worked out.

James B. McClements, M.D., *Chairman*

O. S. Allen, II, M.D.
M. Gibbs, M.D.
J. Lewis, M.D.
D. A. Nelson, M.D.
R. W. Powell, M.D.
D. E. Saunders, M.D.
I. J. Tikellis, M.D.
A. Zimmerman, M.D.

MEDICAL ECONOMICS COMMITTEE

The increasing cost of our health insurance due to our group's being experience-rated has been of great concern to the Society. We have made inquiries of alternate carriers in an attempt to secure less expensive coverage. The most effective way to control these costs is to control the use of services; in other words, the more services used, the higher the costs when a group is experience-rated.

We continue to enjoy favorable rates for disability insurance through our carrier, Bertholon-Rowland.

Our Society has been endorsing the Keogh programs provided by PRO Services, Inc. since 1963. Because of the changes in the tax law provided by both the Professional Corporation Act and the 1969 Tax Reform Act, PRO Services, Inc./Modern America Securities, Inc. have expanded the services and tax-sheltered investments they are offering the members of their endorsed professional societies.

Davis G. Durham, M.D., *Chairman*

O. S. Allen, II, M.D.
C. L. Edwards, M.D.
J. R. Fox, M.D.
C. E. Graybeal, M.D.
J. M. Levinson, M.D.
R. L. Meckelnburg, M.D.
R. W. Powell, M.D.
H. S. Rafal, M.D.
D. Schetman, M.D.
I. J. Tikellis, M.D.

MEDICAL LOANS COMMITTEE

As Chairman of the Medical Loans Committee I sat with the Academy of Medicine Loan Committee under Dr. Lewis B. Flinn's chairmanship. Colonel E. G. Allen represented the University of Delaware Financial Aid program; Dr. W. V. Whitehorn represented DIMER; and Dr. Allston Morris, Dr. Lalor Burdick, Dr. G. A. Zurkow, and Dr. Harry J. Repman represented the Academy. The Medical Society of Delaware had $1,250 for use after honoring the $500 annual scholarships to Mr. Shockley of Howard University College of Medicine and Mr. Kuhn of Jefferson Medical College.

Before starting the discussion concerning individual requests, the Committee voted to indicate to those students in Medicine, Dentistry, Oral Hygiene, Physical Therapy, and Optometry programs that they should anticipate interest on their loans starting three months after graduation payable twice yearly. For students choosing any accredited internship in the State of Delaware, 10% of their total loan will be waived. This will hold only for the internship year.

The Academy awarded loans just short of $25,000 to thirty applicants, and $1,000 from the Medical Society was divided between Mr. John R. Neill at the University of Maryland School of Medicine and Mr. Gary M. Owens of the Jefferson-Delaware program (in addition to the $2,000 awarded by DIMER). The $250 which is not being put to work will be held over for next year.

Gordon Keppel, M.D., *Chairman*

C. Allen, M.D.
J. E. Benzel, M.D.
E. S. Dennis, M.D.
J. A. Elliott, M.D.
W. R. Johnson, M.D.
C. Papastavros, M.D.
H. Wilk, M.D.

MEDICAL SCHOOL FOR DELAWARE LIAISON COMMITTEE

The Medical School for Delaware Liaison Committee members were the guests of Doctors Trabant and Whitehorn for cocktails and dinner. Doctors Trabant, Whitehorn, Dowling, and Worrilow spoke for the University of Delaware, and Doctor D'Alonzo spoke for the Medical School for Delaware Committee. Doctor Bishoff also spoke.

In essence, a summary of the remarks from the University group is as follows: sixteen medical students are in the first and present class, having been selected from a group of forty-three applicants, and there are presently twenty-nine applicants for twenty places for the next class of September 1971. Doctor Whitehorn stressed that their Health Sciences program was trying to integrate between the University of Delaware, Delaware State College, and the Delaware Community College.

DIMER was discussed and some problems relative thereto. Doctor Whitehorn then described both the five-year medical program and the six-year one. He revealed that the five-year program sacrificed nothing and was possible by foregoing all vacations and holidays. The six-year program was based on an avoidance of overlapping of teaching, and utilizing a better correlation of subject matter.

There are at least five task forces working between Jefferson and the University of Delaware on the integrated medical programs, directed toward the Social, Behavioral, Humanitarian, and Allied Medical facilities.

Doctor Whitehorn hoped that the University of Delaware would have a small undergraduate medical teaching staff on the campus by 1972. They planned maximum use of local medical talent, the University of Delaware faculty, and institutional sources. The one area in which more needs to be done is in the development of research as related to State medical needs, as well as adequate health care delivery.

The plans for the future revolve around the report of the Carnegie Commission of Medical and Dental Education, with implementation of possible points contained therein, such as:

1. A reduction of the time required for the education of doctors.
2. Better integration of University facilities with medical schools, especially with the health sciences. The University of Delaware plans to expand and develop the School of Health Sciences, creating faculties for both the Medical School and Medical Research.

Dr. Trabant stressed that when he became President of the University of Delaware he spoke of his three main thrusts:

1. The development of Marine Sciences.
2. The development of over-all education in Delaware.
3. Creating Medical and Health Sciences facilities.

He feels he is well on the way toward fulfilling these thrusts.

Dr. Worrilow asked for patience in developing these programs before any agitation is made for a four-year Medical School. Doctor Harry Dowling gave a moving talk about Delaware being a small state, but with excellent hospitals throughout, highly qualified doctors, and an outstanding opportunity existing for developing these facilities and program with a high potential for implementation and success. He was most optimistic about all of these points.

Many questions were asked from the floor, and a most frank question and answer discussion followed.

Doctor D'Alonzo stressed that the Medical School Committee was indeed grateful to Dr. Trabant.

Doctor D'Alonzo asked for a rising vote of both confidence and thanks for Doctors Trabant, Whitehorn, Dowling, and Worrilow. All of the Committee agreed and so responded.

The Medical School Committee feels indebted to Dr. Trabant and his cohorts at the University for these interests, thrusts, and accomplishments. The Committee is proud of the programs and their potential, proud of the University of Delaware and its President, and equally pleased with the highly qualified and understanding consultants with whom he is working on these health sciences programs.

C. Anthony D'Alonzo, M.D., *Chairman*
J. E. Marvil, M.D., *Co-Chairman*
R. T. Beattie, M.D.
J. J. Bredall, M.D.
S. W. Casscells, M.D.
H. R. Cowell, M.D.
D. G. Durham, M.D.
C. L. Edwards, M.D.
J. B. Geissinger, M.D.
K. K. Kimura, M.D.
L. P. Lang, M.D.
J. M. Levinson, M.D.
E. W. Martz, M.D.
D. A. Nelson, M.D.
L. W. Whitney, M.D.

MEDICAL SERVICE AND PUBLIC RELATIONS COMMITTEE

The Medical Service and Public Relations Committee has not been very active during this past year Two meetings were held with regrettably poor attendance. In spite of this fact, a few things were accomplished. Subjects of medical importance were given to two of the local radio stations for public dissemination.

Information was provided to the local news media regarding changes in Society policy resulting in the removal of physicians from the Board of Trustees of Blue Cross-Blue Shield as official representatives of the Medical Society of Delaware.

Negotiations are still underway with Homemakers-Upjohn, a subsidiary of the Upjohn Company, which has shown interest in providing medical information to the public by means of radio and newspapers. A final decision on this proposal has not yet been reached.

It has been suggested that representatives of the

Society meet informally with the members of the State Legislature as a means of strengthening the ties between the medical profession and the lawmakers so that all concerned might be better aware of each other's problems. The proper format has not yet been developed to make this a reality, and perhaps in the year to come, this project will be studied further in the hope that its goals can be accomplished.

Started in 1967, the Medical Explorer Post #530 continues to have a successful existence.

As you know, our efforts have been to interest young people, juniors and seniors in high school, in medicine as a career. Our aim is to try to interest youngsters from all segments of our population.

In 1970-1971 the Explorers have been officially enlarged to include women.

1970
October — Winder Porter, M.D. — Public Health
David Levitsky, M.D. — Premature Care
November — Edgar Johnson, M.D. — Reconstructive Surgery of the Ear
Manuel Abello, M.D. — Anesthesiology
Karl Semlak, M.D. — Orthopedic Surgery
Richard Brams, M.D. — Allergy
1971
January — Allen Davies, M.D. — War Injuries and Vascular Surgery
February — Richard Lennihan, M.D. — Newer Diagnostic Methods in Vascular Surgery
Richard Zahn, M.D. — Occupational Medicine
March — Ted Chronister, M.D. — Pediatric Neurology
April — Anthony Narvaez, M.D. — Cytogenetics
Edwin Katzman, M.D. — Practical Aspects of Medical Practice
May — Anthony Cucuzzella, M.D. — Physical Medicine
George Voegele, M.D. — Psychiatry

The advisors of Post #530 continue to be Dr. John Furlong, Dr. Edwin C. Katzman, Dr. Jane C. Straughn, and Dr. David A. Levitsky. Dr. Patrick Ashley continues to demonstrate autopsies, and Dr. Luis Mario Garcia continues to be the liaison with the Board of Trustees.

The first meeting of the 1971-72 schedule will be on September the 21st; the meetings will continue to be on the second and fourth Tuesday at 7:30 p.m.

Scheduled for 1971-72 are Dr. Levitsky in September and October, Dr. Katzman in November, Dr. Straughn in December, Dr. Furlong in January, Dr. Levitsky in February, Dr. Katzman in March, Dr. Straughn in April and Dr. Furlong in May.

There were 22 members of the troop, male and female, in 1970-71. Of interest, two of these were doctors' children.

L. Mario Garcia, M.D., *Chairman*
W. H. Comer, M.D.
S. G. Elbert, Jr., M.D.
R. B. Flinn, M.D.
R. F. Lewis, M.D.
P. J. Mette, M.D.
C. L. Reese, III, M.D.
S. G. Rogg, M.D.
L. Rosenbaum, M.D.
D. E. Saunders, M.D.

COMMITTEE ON MEDICINE AND RELIGION

With the addition of Chaplain Swanson, Director of the Department of Pastoral Care of the Wilmington Medical Center, to the Committee on Medicine and Religion of the Medical Society of Delaware, new impetus has been given to a more coordinated association between clergy and physicians of the State. The report reflects this new impetus.

1. Mr. Arne Larson, Director of the Department of Medicine and Religion of the American Medical Association, was invited to the Wilmington Medical Center earlier in the year. The afternoon of his visit, Chaplain Swanson, Mr. Lawson, Administrator of the Delaware Division, Mrs. Shane, Executive Director of the Medical Society of Delaware, and the Chairman, took a tour of the hospital and discussed the work of the Committee, as it relates to the goals and objectives of the national body. Following this visit, full endorsement of the program was granted.
2. Soon after Mr. Larson's visit, Chaplain Swanson was asked to present his "Staff Guide For Pastoral Care Services" to the Northeastern Regional Meeting of the Committees on Medicine and Religion in New York. This was done on February 2, 1971. Subsequently the Chaplain was made a member of the Committee on Medicine and Religion of the Medical Society of Delaware.
3. As of the 12th of August, we have visited all four hospitals downstate and the Wilmington Medical Center, and Chaplain Swanson has visited the Delaware State Hospital and the Veterans Administration Hospital in Elsmere. We have received written communication concerning Riverside Hospital, to which we plan to make a visit in the near future. These visits were for the purpose of determining the working relationship between clergymen and physicians, chaplain (if they had one) and hospital staff, pastoral visitation service, and the availability of a chapel in time of grief or for worship. At the proper time a report shall be submitted concerning our findings. This report will also include St. Francis Hospital.
4. The Committee plans to aid the Chaplain, as

he plans seminars on the subjects of death and dying, for the local physicians, clergymen, residents and interns.

5. The Committee has assisted the Chaplain as he planned the Annual Clergy-Physician Conference, sponsored by the Department of Pastoral Care. On September the 29th, a Banquet is being held in the Gold Ballroom of the Hotel duPont. Clergymen and physicians are encouraged to attend this annual affair. Dr. Seward Hiltner, Professor of Theology and Personality of Princeton Seminary, is the guest speaker.
6. Through the suggestion of Dr. Rhoslyn Bishoff, the First Annual Prayer Breakfast will precede the 182nd Annual Meeting of the Medical Society of Delaware in Dover. The Committee has planned this meeting; one of the participants is a resident of the Wilmington Medical Center, Dr. Daniel McCready, Intern of the Year, 1971. Dr. Thomas Kuon, who has recently gone into private practice, will also participate.
7. The Committee feels it should coordinate its work with the Department of Pastoral Care of the Wilmington Medical Center, as it is obvious the Chaplain is daily made aware of the spiritual needs as they relate to medical needs of patients. He is also readily available to hospital staff, physicians, and clergymen, as they are confronted with the needs of patients. He has given direction and guidance to the Committee since his coming the first of December, 1970.

Charles M. Bancroft, M.D., *Chairman*

J. B. Baker, M.D.
S. Bishop, M.D.
S. G. Elbert, Jr., M.D.
T. H. Hogshead, M.D.
W. J. Holloway, M.D.
R. N. Taylor, M.D.
R. H. Weiss, M.D.
The Reverend L. Casson
The Reverend C. Hart
The Reverend L. Swanson

COMMITTEE ON MEDICO-LEGAL AFFAIRS

The Joint Screening Panel of the Medical Society of Delaware and the Delaware Bar Association has deliberated 10 cases in the past year and continues to hear new cases as they are presented.

The Chairman of the Committee on Medico-Legal Affairs attended the annual national Medico-Legal Symposium sponsored by the AMA and the American Bar Association in New York in 1971.

Several matters of general medico-legal interest will be taken up at a forthcoming meeting of the entire Committee. Many items of medico-legal interest figure also in other committees, particularly the Liability Insurance Committee, with which liaison is being maintained.

The panel is losing Albert Simon, Esquire, as the Co-Chairman from the Delaware Bar Association and wishes to express its appreciation for his long and dedicated service.

Martin Gibbs, M.D., *Chairman*

J. A. Arminio, M.D.
G. K. Berger, M.D.
J. L. Campbell, M.D.
S. W. Casscells, M.D.
I. F. Chavin, M.D.
W. B. Cooper, M.D.
C. E. Graybeal, M.D.
A. Z. Hameli, M.D.
R. C. Hayden, M.D.
E. R. McNinch, M.D.
R. L. Meckelnburg, M.D.
J. T. Metzger, M.D.
D. A. Nelson, M.D.
C. Papastavros, M.D.
R. W. Powell, M.D.
H. Rosenblum, M.D.
D. Schetman, M.D.
I. J. Tikellis, M.D.
R. H. Weiss, M.D.

COMMITTEE ON MENTAL HEALTH AND ALCOHOLISM

Activities of the Committee during 1970-1971 are as follows:

1. Emergency help provided the Department of Corrections in the psychiatric evaluation of a large number of parolees in conjunction with the Delaware Psychiatric Society (extending from 1970 into 1971).
2. Assistance to the President and the Executive Director of the Delaware Mental Health Association in the planning and development of additional mental health centers for Delaware.
3. Assistance to the Department of Public Safety in the Alcohol Countermeasures Program to prevent traffic accidents on the highways.
4. Assistance to the Delaware Association for the Study of Alcoholism to expand their present program of education, prevention and rehabilitation.
5. Assistance to the Junior League of Wilmington in the development of a program of education and rehabilitation of the emotionally disturbed (juvenile pre-offenders) adolescent female, including setting up a residence, etc.
6. Assistance to a group of ministers in setting up a program of education and assistance in counseling and clinical training with the possibility of help in specific areas when requested.
7. Assistance to the National Alcoholics Anonymous Movement in a Revitalization Program effort.
8. Assistance to the Department of Health and Social Services, in conjunction with a group of private citizens, in a study to provide more effective legislation in the field of mental health as it affects crime. This was an experimental program.
9. Assistance to the Methodist Country House and Manor House in the development of a Mental Health Program.
10. Assistance to several groups in the black community in the field of mental health and crime.
11. Continuing assistance to the Ferris School in

the development of a more effective Rehabilitation Program (Mental Health). This includes the participation and assistance of a group of private individuals.

12. Assistance to the First Interagency Statewide Conference on Alcoholism provided by Howard L. Reed, M.D., Medical Director of Hercules Incorporated.
13. Generally improved relationships and dialogue between the Medical Society of Delaware and the Delaware Psychiatric Society in the field of mental health and alcoholism.

Thomas H. Hogshead, M.D., *Chairman*

T. M. Alatur, M.D.	**K. Gurdikian, M.D.**
F. W. Baker, Jr., M.D.	**R. J. Kester, M.D.**
L. Bales, M.D.	**D. W. MacKelcan, M.D.**
S. Bishop, M.D.	**J. Pearson, M.D.**
E. N. Cuba, M.D.	**H. L. Reed, M.D.**
L. O. DeBernard, M.D.	**M. E. Traynor, M.D.**

W. J. Vandervort, M.D.

PEER REVIEW AND PROFESSIONAL EVALUATION COMMITTEE

This state committee consists of the three county committees appointed by the county society presidents, plus a state chairman appointed by the state society president. During the past year the practice was continued of virtually weekly meetings between the state chairman, the state executive director, and the manager of utilization review of Blue Cross and Blue Shield of Delaware, Inc. From these discussions on practice patterns arose decisions to forward material and questions to the various county committees for their consideration, usually in reference to the possible development of guidelines for future educational use in the direction of quality care at reasonable cost with documentation of medical necessity where indicated. Thus this committee does not consider specific fee problems or specific single patient complaints, but rather approaches a single physician only if the practice patterns studied suggest an educational opportunity for the benefit of all physicians by the possible development of new guidelines, or if in addition the particular physician in question seems to need some education himself. The purpose is to educate, and when necessary to rehabilitate, not discipline or annihilate. When this does not succeed, the question of discipline is turned over to other mechanisms of the society or of the state. This has been necessary in only two cases.

The individual county committees meet together most often, and the New Castle County Committee has been the most active as one would expect from the point of view of physician population.

All members have met together as a state committee on only two occasions since the 1970 meeting of the House of Delegates, namely on December 10, 1970, and on September 29, 1971. A spring meeting had been contemplated but did not materialize because of the illness of the chairman.

This time last year there were four approved guidelines submitted as a part of the annual report. There are now ten guidelines, so that six new ones have been developed during the year. These are:

Guideline No. 5 — If a hospital utilization review committee has determined that continued hospitalization for a given patient is no longer medically necessary, the attending physician should see the patient as frequently as desired, but third party payments to the physician should be for visits not to exceed every third day, or the minimum number of visits the hospital may require for a hospitalized patient.

Guideline No. 6 — When a pattern of practice is encountered in which a patient is seen in home or office more than four times a month for a period of three consecutive months, the medical necessity for subsequent such visits at that frequency must be documented by the physician.

Guideline No. 7 — While it is a recognized and accepted pattern of practice to perform periodic (annual) diagnostic re-evaluation of patients under regular treatment for some chronic diseases, the physician and his patient must not equate this service with a routine annual physical examination, which is not a covered service under Medicare.

Guideline No. 8 — The physician should not bill for any injections for medication which medical opinion considers to be equally effective by the oral route unless the reason for using other than the oral route is clearly documented by the physician.

Guideline No. 9 — In long-say hospitalization cases where the physician bills on a per visit basis, while daily notes on the progress sheet from the inception would be consistent with good medical practice, documentation of the physician's visit by suitable notes on the progress sheet would be required after the 24th day if such visits are to be reimbursed under Medicare, Medicaid, Blue Shield prevailing fee programs, etc.

The New Castle County Committee has taken the first initiative toward the study of positive programs for the improvement of quality of health care. The current study has been directed toward the indications for certain diagnostic and surgical procedures, especially those which do not lend themselves to peer documentation by hospital tissue committees. The first procedure to be considered was tonsillectomy and/or adenoidectomy. Questionnaires were sent to a number of otolaryngologists, pediatricians, and general practitioners, and then the Committee developed the following guideline which was approved first by the New Castle County Committee, and on September 29th by the State Peer Review and Professional Evaluation Committee.

Guideline No. 10 — The indications for tonsillectomy and/or adenoidectomy:

1. After an acute peritonsillary abscess
2. Chronic or recurrent serous otitis media with hearing impairment
3. Recurrent tonsillitis especially if due to Group A Beta Hemolytic Streptococcus, and especially if the patient is allergic to penicillin
4. Obstruction of airways by hypertrophied adenoid tissue resulting in either heart failure or growth failure, or adenoidal facies

The following are not considered indications for tonsillectomy and/or adenoidectomy:

1. Asthma
2. Chronic hoarseness
3. Recurrent epistaxis
4. Frequent upper respiratory infections
5. "Big Tonsils"

The attending physician has a particular responsibility to observe these indications when more than one member of the same family is scheduled for this type of surgery at the same time.

It is hoped that the Kent and Sussex Committees will follow the initiative of New Castle in undertaking positive studies toward the improvement of health care quality.

Finally, some suggestions for the future have been considered.

Membership on peer review committees should be staggered and rotated so that there will always be both experience and new involvement.

The various specialty groups should form their own peer review mechanisms and work closely with the state and county committees.

The clinical departments of the various hospitals should have similar mechanisms functioning in coordination with the state and county efforts.

The effectiveness of peer review will be augmented by improving its visibility to the profession and to the public.

William O. LaMotte, Jr., M.D., *Chairman*

A. E. Bacon, M.D.	**W. P. Portz, M.D.**
W. W. Briggs, M.D.	**D. J. Reinhardt, III, M.D.**
R. B. Glidden, M.D.	**G. R. Spong, M.D.**
D. A. Levitsky, M.D.	**H. Taylor, M.D.**
C. M. Moyer, M.D.	**I. J. Tikellis, M.D.**
W. Omans, M.D.	**D. T. Walters, M.D.**

PREPAYMENT COMMITTEE

During the last year, the Prepayment Committee of the Medical Society of Delaware met seven times. As always, the Committee spent a great deal of time on day-to-day operational problems.

These problems fall into three general groups. First, a complaint may be lodged by a physician regarding some policy of Blue Cross and Blue Shield. Whenever possible, the Committee has attempted to resolve these complaints. Second, Blue Shield may wish to institute a procedural change affecting physicians and in this instance enlist the help and advice of the Committee. In some cases, it is required to gain the approval of our Society via the Prepayment Committee. The third general category of operational problem involves local adaptation to the flow of governmental regulations relating to the Medicare and Medicaid programs. It is anticipated that this will be of increasing importance in the coming years.

In addition to the routine business, the year has seen a number of important developments in the area of Prepayment. Of great interest to all members of the Society is the completion of a task begun in the preceding year — the participating physician's agreement between members of the Medical Society of Delaware and Blue Cross-Blue Shield, Inc. This contract combines the original Blue Shield contract, that is, the indemnity plan, with the contract of the so-called Chrysler Plan and also all of the additions and all of the alterations which have been agreed upon over the years. By and large, this new contract reaffirms and clarifies the relationship between the participating physician and the plan which already exists. Of course, in a few areas, this relationship has been altered. One change of significance is that the physician is no longer at risk in the event of Blue Shield's inability to cover in full the claims of its subscribers because of impairment of its reserves.

The contract as it now stands is being reviewed by our legal counsel, and we anticipate it will be ready for approval by the House of Delegates.

This year has seen considerable expansion of the prevailing fee program with the proportionate reduction in the number of indemnity contracts outstanding. Both the Comprehensive-80 and the Comprehensive-100 plans have shared in this expansion. At first, it was necessary for Blue Shield to obtain the approval of the Medical Society of Delaware before offering a Comprehensive-100 policy to a new group. During this year, the Prepayment Committee seriously studied the future of the Comprehensive-100 plan. One group felt that this plan had been successful and need no longer be considered a pilot program. This group therefore recommended that Blue Cross-Blue Shield be allowed to market this plan as they wished without approval from the Medical Society. Other members of the Committee felt that the Comprehensive-100 plan had serious inherent drawbacks in that the plan had no deductibles or co-insurance, and thus widespread enrollment in this plan might result in problems of overutilization. After much discussion and some vacillation the proponents of the first view won out, and the Comprehensive-100 plan is now being freely marketed.

Another major development during this year was the elimination of direct physician representation on the Board of Directors of Blue Cross-Blue Shield. This move seems to follow a trend which is nationwide. Perhaps one of the motivations behind it was an attempt to still the public clamor which maintains that physicians serve themselves rather than the public as members of the Blue Cross-Blue Shield Board. While there can be little doubt that this view is misguided, it may be best to avoid the appearance of a conflict of interests and further, being freed of the responsibility that accompanies such board positions, this physician may be better able to negotiate with Blue Cross-Blue Shield. Another reason advanced by some for this change is the fact that Blue Shield is now "come of age" and no longer needs to be sheltered or given preferential treatment by the medical profession. One might observe that it is less "the doctors' plan" than before and that the relationship between the medical profession and Blue Shield now more nearly resembles the relationship which exists between us and all other insurance carriers.

The recent institution of the Medicare program has brought with it new problems for both the physician and his patient. In assessing these problems the Prepayment Committee felt compelled to offer some advice to the practicing physician. We felt that, for a multitude of reasons, it would be best for the physician to deal directly with his patient and not accept assignment. This opinion was conveyed to members of the Society by the Newsletter. This concept was not originated by us in that this action is merely a reaffirmation of the current AMA position on the acceptance of assignments. This position in no way implies a lack of cooperation with the Medicare program, but it is rather an attempt to preserve the link of mutual responsibility which binds the physician and his patient for their mutual benefit.

Th Prepayment Committee has before it a great deal of work for the coming year. The implications for the recently announced wage and price freeze upon the medical profession are not yet clear. Methods are currently being studied for more accurate computation of the 90th percentiles. Also under consideration are improved methods of handling small specialty groups where the computation of the 90th percentile is impossible and impractical. Simplified claims forms are also under consideration. In addition, the Committee invites the comments of all the members of the Society and whenever possible it would be happy to help any member with any individual problem he might have in the Prepayment field.

Joseph E. Belgrade, M.D., ***Chairman***
R. Walter Powell, M.D., ***Vice-Chairman***

J. W. Abbiss, M.D.
J. A. Arminio, M.D.
J. H. Benge, M.D.
I. F. Chavin, M.D.
C. L. Edwards, M.D.
J. J. Egan, M.D.
J. A. J. Forest, Jr., M.D.
J. Gelb, M.D.
M. Gibbs, M.D.
C. I. Glassman, M.D.
C. E. Graybeal, M.D.
S. R. Kaplan, M.D.
N. Kuseybi, M.D.
A. Lazarus, M.D.
J. M. Levinson, M.D.
D. A. Levitsky, M.D.
R. L. Meckelnburg, M.D.
E. H. Mercer, M.D.
W. W. Moore, M.D.
D. Platt, M.D.
K. S. Russell, M.D.
A. H. Seeger, M.D.
O. Sluzar, M.D.
H. Taylor, M.D.
I. J. Tikellis, M.D.
L. W. Whitney, M.D.
H. Wilk, M.D.

MEDICAL REVIEW COMMITTEE

(Subcommittee of the Prepayment Committee)

The Medical Review Committee held four meetings in this past year. As in previous years, the Committee's major effort was directed toward resolving differences between individual participating physicians and the plan. These differences arise when a physician feels that the payment offered for a particular service under the prevailing fee contract is inadequate.

Often these differences arise through misunderstanding or through clerical error. Often it is merely a matter of the physician providing more complete information on the nature of his services through the mechanism of the Medical Review Committee. At times, the physician has requested to appear before the Committee so as to more thoroughly present this information.

Considering the tremendous number of claims submitted by participating physicians, it must be acknowledged that the prevailing fee program is operating quite smoothly and produces a small number of conflicts between the plan and the participating physicians.

From time to time, quite a few physicians have felt that Blue Shield was tardy in its payments to the physicians. The Medical Review Committee has investigated these complaints, and during this year we instituted a program whereby the number of unpaid claims will be kept under constant surveillance.

One important fundamental change in the operation of the Medical Review Committee was undertaken this year. In the past Blue Shield has obtained medical advice from individual members of the Medical Review Committee. This practice will continue; however, the judgments of these consultants will be reviewed by the entire Committee, and decisions will be recorded in the minutes. Also, we shall be more strict about the Medical Review Committee making known all of its activities to the parent committee, the Prepayment Committee. In this way, we hope to achieve an accurate record of our decisions so that in future years we will not have to rely so heavily on our memories. This should serve to the advantage of all concerned.

Joseph E. Belgrade, M.D., *Chairman*

J. H. Benge, M.D.
I. F. Chavin, M.D.
C. L. Edwards, M.D.
J. Gelb, M.D.
C. E. Graybeal, M.D.
A. Lazarus, M.D.
J. M. Levinson, M.D.
W. W. Moore, M.D.
D. Platt, M.D.
L. W. Whitney, M.D.
H. Wilk, M.D.

COMMITTEE ON REHABILITATION

The Committee on Rehabilitation witnessed many changes in the concept of vocational rehabilitation during the year. It saw, for example, the development of a new program that promised to double the number of clients handled by Vocational Rehabilitation Service, a division of the State Department of Labor.

The new program, developed in the final quarter of Fiscal '71, will be greatly implemented in the coming year. The program calls for extension of Vocational Rehabilitation Services to Delaware public assistance recipients (in addition to traditional VR clients), and the utilization of social workers, employment counselors and traditional VR personnel under one line authority agency: Vocational Rehabilitation Service. Fourteen VR centers are being established throughout Delaware, representing an impressive expansion of personnel and programs. A special unit at the Delaware State Hospital will provide a total vocational evaluation program during the patient's hospitalization in order to establish a definite rehabilitation plan to be followed upon the patient's release from the hospital. Evaluation and rehabilitation techniques will be specially designed for those patients with mental, personality and social disorders.

During the year, 684 clients (the same as the previous year) of Vocational Rehabilitation Service gained gainful employment, bringing to 14,091 the number rehabilitated since the inception of the program in 1939. A total of 3,600 persons received some rehabilitation service as compared to 2,832 in the previous year.

Vocational Rehabilitation Service employed physicians for 4,647 examinations, surgery and treatments of rehabilitation clients at a cost of $152,897. An additional $69,501 was spent for hospital fees for clients under the program.

The Committee wishes to thank physicians, hospitals, and sanitoriums for their active role in making referrals: approximately 38%.

David L. Schafer, M.D., *Chairman*

G. J. Boines, M.D.
A. A. Boytar, M.D.
H. B. Cates, M.D.
H. G. DeCherney, M.D.
J. J. Gallagher, M.D.
K. Gurdikian, M.D.
J. S. McDaniel, M.D.
E. S. Parvis, M.D.

SCHOOL HEALTH COMMITTEE

This report is actually an interim report on a project started last spring.

There has been a great deal of thought and consideration of the general concepts of school health, but it has always been recognized that there are differences in view point in the various districts to school health programs. The professional working in even the generally accepted programs will put different emphasis in these programs if his district is affluent, poor, rural or urban.

In an effort to determine which problems are common for all districts and which are purely local, a questionnaire is being prepared. This is being done with the help and encouragement of Mrs. Vincent, State Supervisor of School Nurses, and Mrs. Wilcox, Nursing Supervisor, University of Delaware. The questionnaire will be presented to the local districts this fall. It is hoped that the information will be helpful and thought-provoking.

The past year, particularly because of the emphasis on Drug Abuse, has seen a reevaluation and renewed interest in health education. This encompasses the Legislature and local and state involvement. All aspects of health education should benefit.

The past year has been highly successful in a rubella immunization program through Delaware schools. In some districts the other immunization programs may have suffered as a consequence.

The Committee would like to endorse the recommendations of last year that a coordinator of health education be appointed at the state level. The Committee would also recommend school physicians or consultants in all districts.

The schools need the help of the medical community, but we in turn need well-informed healthy patients. We must all work together in this common goal.

John A. J. Forest, Jr., M.D., *Chairman*

S. Bishop, M.D.
A. A. Boytar, M.D.
J. L. Campbell, M.D.
R. W. Frelick, M.D.
E. F. Gliwa, M.D.
G. R. Hilty, III, M.D.
W. R. Johnson, M.D.
G. Keppel, M.D.
M. Liebesman, M.D.
L. C. Mankin, M.D.
E. G. Orton, M.D.
M. E. Traynor, M.D.
D. T. Walters, M.D.

COMMITTEE ON VENEREAL DISEASE

Venereal disease continues to increase both locally and nationwide. In 1970, the American Social Health Association reported a nationwide one-year rise of 8% in reported cases of infectious syphilis and 16% in reported cases of gonorrhea. It is estimated that there are 250,000 of all forms of syphilis diagnosed and treated each year. Gonorrhea is pandemic in the United States with an estimated 2,000,000 cases.

In view of this alarming increase, the American Medical Association prepared a statement on venereal disease which was published in the May issue of our *Journal.* This statement urges all medical societies to cooperate and give broad support to public health authorities in their attempts to control and eradicate venereal disease.

The AMA House of Delegates at Atlantic City adopted a resolution calling for the AMA to develop a slide presentation for lay audiences entitled "Control of Venereal Disease". Your Committee on Venereal Disease supports this resolution and has informed the AMA that it will actively promote such a slide presentation and help develop local education programs. A good VD educational program is urgently needed at the high school level, and this slide presentation should be most helpful.

Patrick F. Ashley, M.D., ***Chairman***

S. G. Elbert, Jr., M.D. **D. Schetman, M.D.**
V. C. Nah, M.D. **C. Vileisis, M.D.**
W. L. Porter, M.D. **R. Zaragoza, M.D.**

AMERICAN CANCER SOCIETY DELAWARE DIVISION, INC.

In addition to its continuing Professional Education program, providing films and publications for physicians, nurses, dentists, and hospital staffs, the Delaware Division of the American Cancer Society sponsored a session on oral cytology for dentists; funded two lectures for the continuing education of physicians, one in Kent and one in Sussex Counties, and one medical education lecture for the Wilmington Medical Center. The theme of the Annual Seminar held in Dover for nurses was Chemotherapy and Radiology.

Another project was the three day in-service training program for non-professional staff at Tilton Terrace Nursing Home, which will be extended this year to other nursing homes.

The scholarship program supported nine undergraduate scholarships in Biological Sciences at the University of Delaware and attendance of two graduate nurses at the Cancer Workshop at New York University and Memorial Hospital, New York, the attendance of two nursing students at a Work Study Program at Memorial Hospital, New York. Through its Public Education Program the Division held 1,121 programs featuring 43 speakers. The American Cancer Society acted as the coordinating office for the Interagency Council on Smoking and Health.

All media continued to publicize the Society's activities. Henry P. Davidson of the News-Journal attended the Science Writers' Seminar in Phoenix, Arizona.

There was an increase in the number of cancer patients helped this year with drugs, dressings, prostheses, blood counts, etc. The Visiting Nurse Association increased the number of visits to cancer patients supported by the Patient Aid Program.

The Board of Directors has been working on implementing the recommendations made by the national study team that evaluated the Division's organization and program last year.

The American Cancer Society appreciates the continued support and interest of the members of the Medical Society of Delaware. I have attended the National Board Meeting of the Cancer Society as professional delegate from Delaware, and serve as liaison for the cancer program.

Oscar N. Stern, M.D., ***Liaison***

CHILD DIAGNOSTIC AND DEVELOPMENT CENTER OF DELAWARE

On June 30, 1971 the Child Diagnostic and Development Center of Delaware completed six-and-one-half years as an evaluation clinic for Delaware children with handicaps involving the nervous system. On that date the Child Diagnostic and Development Center of Delaware was dissolved and became the Child Diagnostic and Development Clinic of the Alfred I. duPont Institute with offices on the third floor of the Institute. The Child Diagnostic and Development Clinic is now considered a part of the services to crippled children provided by the Alfred I. duPont Institute of the Nemours Foundation. The method of operation and the staff will continue the same for the foreseeable future.

During 1971, 153 new patients were seen for complete evaluation, involving 532 patient or family visits. In addition, 183 other children were seen for follow-up examinations, involving 282 visits. Total visits with evaluation team members amounted to 814 contacts. The nurse coordinator made 77 visits to 65 new patients in the home or school. In addition, 18 patients were seen on follow-up visits. Our social workers were involved with 49 families in counselling sessions, involving 140 visits.

Of the new patients seen, 76 or 50% showed some form of retarded development. 97 patients showed some form of disturbed cerebral functioning manifested by behavior disorders, learning problems, or seizures. 77, or just over 50% of children seen, were five years of age or younger. Males outnumbered females by two to one. Private physicians, chiefly pediatricians, continued to be the greatest referral source amounting to over two-thirds of our referrals. Most of the children continue to come from Wilmington and New Castle County with only 11% being referred from Kent and Sussex Counties.

During the past year the Child Diagnostic and Development Center was co-administrator with the Delaware Curative Workshop in the operation of the Developmental Center. This is a pilot project supported to a large degree by Federal funds, which endeavors to improve development of children between two and five years of age who are delayed in one or more areas, including motor, language, adaptive and personal-social behavior. The staff of the school consists of a teacher with a Master's Degree in psychology, a speech therapist, a physical therapist, an occupational therapist, a part-time social worker, a training aid, and volunteers. About twenty-five children have been involved in the program to date, and at present there is a morning group of about fifteen children seen for treatment four days a week. The fifth morning is used for parent counselling primarily. The Developmental Center now is held in a building purchased by the Delaware Curative Workshop at 226 West 17th Street.

It appears that we are demonstrating that through early involvement in a therapeutic program, children with developmental delays are progressing at a faster pace than would have been anticipated. The staff and administration of the Developmental Center are most enthusiastic about the progress to date and would be most happy to have regular visitors from the Medical Society of Delaware.

It appears that the Child Diagnostic and Development Center has provided a service to Delaware as referrals continue to increase each year and the waiting list at the end of the year approximates four months. It is hoped that, through becoming a part of the Alfred I. duPont Institute of the Nemours Foundation, the services of the Child Diagnostic and Development Clinic may be expanded and ultimately involve a satellite clinic in Sussex County.

Henry H. Stroud, M.D., *Liaison*

DELAWARE ASSOCIATION OF MEDICAL ASSISTANTS

Your representative has been invitd to attend May, 1971 meeting of the New Castle County Chapter of the Delaware Association of Medical Assistants. On the occasion of that meeting, he had the privilege of installing the incoming officers of the New Castle County Chapter.

Your representative has been invited to attend the Annual Meeting of the Delaware Association of Medical Assistants scheduled for September 25, 1971.

It is recommended that all members of the Medical Society of Delaware encourage the Medical Assistants employed in their offices to join the Delaware Association of Medical Assistants. This laudable Association not only affords valuable educational and social benefits to the medical assistants, but it also serves directly to improve the effectiveness of their work in the offices of their employers. The modest annual dues may be assumed to be office expense, and it is recommended that the members of the Medical Society pay the annual dues of their medical assistants who wish to join this creditable association of Medical Assistants.

Daniel J. Preston, M.D., *Liaison*

DELAWARE DIABETES ASSOCIATION

The American Diabetes Association continues to be active in Delaware through the Delaware Diabetes Association with both professional and lay members, with current total membership of 282.

Now in its fourth year, the "Why Wait" diabetes detection drive continues with free tests being performed every Wednesday at the Memorial Division, independent laboratories, Southbridge Medical Activities Center and downstate hospitals.

The "Young People with Diabetes" group and their parents meet four times a year for discussion and films, with the attendance of local physicians and dietitians. Eight young people from our group attended camp during the 1970 season. The Delaware Diabetes Association helped finance three of these campers by giving two half and one full camperships.

Public meetings with guest speakers are held for continuing diabetic education for all.

In June 1971 the Delaware Diabetes Association was represented by one lay delegate at the Central Council meeting of the American Diabetes Association in San Francisco.

Our delegate's report stated that the Committee on Regional Medical Programs reported that only .4 of 1% is being expended on diabetes in R.M.P. Affiliates were urged to contact their Congressmen encouraging increased support in this area. The Executive Director emphasized the continuing need for effective fund raising, urging Affiliates to begin some form of planned fund raising this year. He also recommended that Affiliates accept and approve the Statement on Racial Discrimination and adhere to the financial standards for National Health Agencies.

R. Walter Powell, M.D., *Liaison*

DELAWARE HEART ASSOCIATION

Under the chairmanship of Alfred E. Bacon, Jr., M.D., the Delaware Heart Association has continued as a dynamic community organization. Continued support has been given the Strep Detection Lab, the Cardiac Clinic, Rheumatic Fever Clinics, and the David Flett duPont Memorial Lecture. Delaware Heart Association has been actively engaged in the pursuit of new knowledge and in the support of research at the local and national level.

New programs initiated during the last year are the Homemaker Rehabilitation Program, and the Phonocardio Scan Program, and support of the Special Cardiac Clinic. Future plans of the Association are: the expansion of the Strep Detection Lab Service to all schools in Delaware, Risk Factor Screening, the establishment of a Rheumatic Fever Registry, and increased educational activities concerning risk factors, the early warning signs of heart attack, the location of emergency facilities, and training in emergency cardiopulmonary resuscitation.

Two new committees will be formed to engage in activities in Diet and Nutrition, and Cardiovascular Nursing.

May we take this time to thank all Delaware physicians who have directly or indirectly been involved in our programs for their continuous support.

Richard Lennihan, Jr., M.D., ***Liaison***

DELAWARE INTERAGENCY COUNCIL ON SMOKING AND HEALTH

Your liaison has participated in smoking withdrawal clinics, and your Society has provided speakers for these clinics. Recently a local franchise of the national organization, Smoke Watchers of America, has commenced operations in Delaware, and it is hoped that this organization will prove effective in aiding smokers who wish to quit the obnoxious habit. The Council's effectiveness in school programs is still being seriously hampered by the negative attitude of smoking teachers and parents.

Your liaison proposes that the Medical Society of Delaware adopt a more positive stance regarding the serious health problems and fire hazards associated with smoking.

Patrick F. Ashley, M.D., ***Liaison***

In accepting the report of the Liaison to the Delaware Interagency Council on Smoking and Health, the House reaffirmed its belief that smoking is a menace and that every educational effort should be exerted to let the public know that the physicians are available to assist them in this regard.

DELAWARE NURSES' ASSOCIATION

As liaison representative with the Delaware Nurses' Association, I would like to report that I have attended several meetings and have experienced a great deal of informal communication with the Delaware Nurses' Association. I have been used primarily in an advisory role and coordinating role with activities that would be of interest to both the Medical Society of Delaware and the Delaware Nurses' Association.

There is nothing specific to report about these activities except that a strong mutual understanding does exist between our organizations.

William H. Duncan, M.D., ***Liaison***

DELAWARE TUBERCULOSIS AND HEALTH SOCIETY

The Delaware Tuberculosis and Health Society continues to enjoy a close relationship with the Medical Society of Delaware.

Mr. Richard R. Griffith, the President, has appointed a committee with myself as chairman to advise and evaluate the activities of the lay members of the Delaware Tuberculosis and Health Society's staff so that information disseminated about air pollution, smoking, and related chest problems will have the support of the Medical Society.

The Delaware Tuberculosis and Health Society continues its generous support of medical activities in Delaware with regard to research grants and educational grants, and involves itself in community problems relating to respiratory diseases.

James M. Hofford, M.D., ***Liaison***

MENTAL HEALTH ASSOCIATION OF DELAWARE

I continue to feel that the liaison between the Medical Society of Delaware and the Mental Health Association of Delaware is a good thing. I had the opportunity to attend a meeting of the Board of Trustees one evening last winter and enjoyed the experience. In addition, I have been in contact with the Executive Director of the Association, Mr. Charles Sikorski, on several occasions.

During the past year the Association has been quite active in the goals of the Delaware State Hospital and the Governor Bacon Health Center. In addition, through the Model Cities Program, it is making efforts to evaluate the mental health needs of the community. The Association is attempting to increase its membership. I would hope that every physician in our state would consider supporting this endeavor.

Richard J. Kester, M.D., ***Liaison***

NOMINATING COMMITTEE

The Nominating Committee met on September 22 and considered positions to be filled for the year October 1971 through October 1972.

The following nominations were made:

Vice President — Stuart W. Rose, M.D.
Secretary — Joseph W. Abbiss, M.D.
Treasurer — Conley L. Edwards, M.D.
Representative to the Delaware Academy of Medicine — Norman L. Cannon, M.D.

For Standing Committees:
Budget Committee
Alfred E. Bacon, Jr., M.D.
John A. J. Forest, Jr., M.D.
Lawrence Katzenstein, M.D.
Nizar Kuseybi, M.D.

Thomas S. Vates, M.D.
Charles Walker, Jr., M.D.
Publications Committee
Robert B. Flinn, M.D.
Bernadine Z. Paulshock, M.D.
William J. Holloway, M.D.
Kazuo K. Kimura, M.D.
Public Laws Committee
Allston J. Morris, M.D.
John W. Alden, Jr., M.D.
Joseph E. Belgrade, M.D.
Rhoslyn J. Bishoff, M.D.
Norman L. Cannon, M.D.
Ronald C. Corbalis, M.D.
Kenneth M. Corrin, Jr., M.D.
Edward S. Dennis, M.D.
Leslie M. Dobson, M.D.
Christopher R. Donoho, M.D.
Edward F. Gliwa, M.D.
Ali Z. Hameli, M.D.
Calvin B. Hearne, M.D.
Peter J. Mette, M.D.
Marjorie J. McKusick, M.D.
Philip L. Rothbart, M.D.
Gerald J. Savage, M.D.
Program Committee
William H. Duncan, M.D.
John B. Geissinger, M.D.
William J. Holloway, M.D.
Charles L. Minor, M.D.
Herman Rosenblum, M.D.
Board of Medical Examiners
James Beebe, Jr., M.D.
John E. Benzel, M.D.
Charles Allen, M.D.
Richardson B. Glidden, M.D.
David Platt, M.D.
C. E. Graybeal, M.D.
Jason L. Campbell, M.D.
Edward S. Dennis, M.D.
Henry H. Stroud, M.D.
William H. Duncan, M.D.
Delegate — American Medical Association
William O. LaMotte, Jr., M.D.
(term expires 12/31/73)
Alternate Delegate — American Medical Association
Henri F. Wendel, M.D. (term expires 12/31/73)

The Committee made two recommendations:

1) That the President appoint Vice-Chairmen for committees
2) That the AMA Delegate be limited to five consecutive two-year terms. This does not apply to the Alternate Delegate.

William O. LaMotte, Jr., M.D., ***Chairman***
R. J. Bishoff, M.D. **A. Lazarus, M.D.**
L. M. Dobson, M.D. **C. S. Riegel, M.D.**

DELAWARE INSTITUTE OF MEDICAL EDUCATION AND RESEARCH

Your liaison presents the following report submitted to him by William V. Whitehorn, M.D., Executive Secretary, Delaware Institute of Medical Education and Research.

"I am summarizing the activities of the Delaware Institute of Medical Education and Research for a presentation to the House of Delegates of the Medical Society of Delaware.

"The Trustees of the Center prepared and presented the General Assembly a budgetary request for 1971-72. The amount finally recommended and appropriated was $1,500,000.

"The Delaware-Jefferson Medical Education Plan continued satisfactorily into its second year. Total number of applications increased to 49. A full complement of twenty students were admitted to the first year class at Jefferson. A total of 36 are now enrolled at Jefferson under this plan.

"The Continuing Education Program for Physicians was highly successful in 1970-71. Ninety-three physicians from all regions of the State were enrolled. The program for 1971-72 has been completed and initiated.

"As partners in the DIMER Programs the Wilmington Medical Center continued its recruitment of full-time educational staff and the University of Delaware progressed in the expansion of its programs in the Allied Health field and in the development of a cooperative Six-year Medical Program with Jefferson Medical College."

In addition I would like to make the following recommendations:

1. An annual position report to the House of Delegates on the activities of the Delaware Institute of Medical Education and Research for the previous year.
2. A mechanism for accountability of expenditures of the public funds appropriated for the Delaware Institute of Medical Education and Research be studied.
3. A request be made to the Governor that the Medical Society of Delaware be allowed to submit nominations for the appointments he makes to the Board of Trustees of the Delaware Institute of Medical Education and Research so that organized medicine can be represented on the Board. (Three members of the Board are appointed by the Governor, three by the University of Delaware, and three by the Wilmington Medical Center.)

Pierre L. LeRoy, M.D., ***Liaison***

MATERNAL AND CHILD CARE COMMITTEE

There has been little change in our programs during the current year. The main areas of impact have been in those pertaining to abortion and interrelated activities.

The Department of Obstetrics and Gynecology with the Administrator at the Wilmington General Division, Mr. R. K. Hartman, have perspectively developed a computerized system of reporting all abortion activity in the Wilmington Medical Center, which essentially means New Castle County. These statistics in their final form for the first year of operation under the new abortion law have just been completed and are currently being subjected to analysis by the Center.

Additional emphasis has been placed on contraceptive counseling with abortion patients following termination of the pregnancy. This new emphasis has resulted in formal counseling on the ward service at the Wilmington Medical Center and Planned Parenthood. Mrs. Peden has even developed a bilingual information pamphlet for appropriate distribution. This counseling service represents a needed advance. Proposal for similar counseling will be made at the September Medical Advisory meeting of Delaware Adolescent Program, Incorporated.

The Delaware State Maternal Mortality Committee reports no deaths resulting from abortion under the Delaware Abortion Law since its inception. Statistics from hospitals have been requested and are being compiled.

The Delaware State Health Department's Maternal and Child Welfare Section has streamlined its reporting of data on neonatal mortality and morbidity. This program has become increasingly effective and should prove increasingly useful for problem identification.

William D. Johnson, M.D., *Chairman*

M. V. Andersen, Jr., M.D.
J. E. Benzel, M.D.
T. E. Chronister, M.D.
A. M. Devenis, M.D.
T. E. Dyer, M.D.
R. E. Erb, M.D.
K. L. Esterly, M.D.
P. Francisco, M.D.
J. B. Geissinger, M.D.
R. C. Hayden, M.D.
G. R. Hilty, III, M.D.
N. Kuseybi, M.D.
W. A. E. Leitzinger, M.D.
D. A. Levitsky, M.D.
C. L. Minor, M.D.
C. P. Turner, M.D.
R. Waterhouse, M.D.
O. S. Weaver, M.D.

As a memorial to the members of the Society who were lost through death during the past year, the assembly arose for a moment of silence as the names were read:

J. Richard Durham, Sr., M.D.
Irvine M. Flinn, Jr., M.D.
Albert C. Gluckman, M.D.
John F. Hynes, M.D.
Walter H. Lee, M.D.
Richard H. Price, M.D.
Sylvester W. Rennie, M.D.
Caleb H. Smith, M.D.
James M. Chase, M.D.
William Marshall, Jr., M.D.

Resolutions considered at the House of Delegates Meeting will be published in the January 1972 issue of the Delaware Medical Journal.

The complete report of the Proceedings of the House of Delegates is on file in the Medical Society office and is available to members for reference.

* * *

Letters to the Editor

To the Editor:

My year as president is past. Its memory will linger forever as a cherished recall.

Such a year was not completed with mirrors. The Annual Meeting is still resounding with quotes that attest to its success. But the Annual Meeting is our society's window dressing. The real work of our society is the result of the involvement of every member of our executive staff, chairmen of committees and their hard working committee members, members of the Board of Trustees, the gracious wives of our Woman's Auxiliary, members of our state's General Assembly and of Congress and the many friends of medicine throughout our state. It is to these people just mentioned and to my colleagues, my family, my office staff, and my patients who overlooked my absence from my office that I now extend my thanks for helping to give me a memory of 1970-1971 that will live with me forever.

Rhoslyn J. Bishoff, M.D.

President's Page

OUR CONTINUING EDUCATION

Physicians as responsible members of society practicing medicine have the obligation for continued education. Physician competence is a basic component in the quality of medical care, and the foundation of competence is medical education. The effectiveness of the enlarging magnitude of scientific knowledge andtechnology in medicine is dependent on the proper communication of these advances and changes and is measured by the benefit of patient care on the day-to-day basis.

Sources of continuing education that have relevance to an individual physician in practice are of considerable number. These sources include over 2400 postgraduate continuing education courses each year, regional and national scientific conventions, books, journals, touring faculties, hospital staff conferences, society meetings, audio-tapes, and many self-instructional devices.

We must now meet the need to develop *within* the profession methods to maintain and evaluate competence. Licensure laws for health practitioners were originally developed as a method of assuring public protection. The possession of a license in itself does not now assure continued professional competence. The acknowledgement of our responsibility for continued education and maintenance of competence makes us accountable. This *voluntary accountability* should include the pride of self-evaluation and appraisal, the achievement of something of value and not a mere fulfillment of a time requirement, some acceptable coercion with incentives. Re-examination with re-licensure is neither effective nor desirable as a method to achieve the goals of continuing education. Examinations measure *knowledge* and not *performance.* The latter is more essential to effective patient care. Self-assessment programs being developed by specialty organizations have great merit in education and are a mechanism of evaluating the educational system. Peer review and self-assessment complement each other as both are oriented to the practical competence of the physician. Peer review evaluates *performance*, and self-assessment measures *knowledge.*

A *documentation-certification* program of physicion participation in continued education sponsored by the Medical Society of Delaware should be implemented now to demonstrate and maintain our responsibility and accountability. The documentation program should be a positive approach to continuing education and physicians' competence. The program can be additionally a strong means of reducing or even stopping governmental encroachment into the realm of medical practice concerned with physicians' competence and the quality control of patient care. The Medical Society of Delaware by establishing and being responsible for such an accreditation program will bring healthy working and coordinating relationships with government, specialty societies, teaching institutions, hospitals and voluntary health organizations. The upward thrust of professional liability insurance premiums can be partially contained by such a program. A compulsory program structured by governmental influences would be compromised to such an extent as to promote mediocrity and have a limited effectiveness for desired purposes. Everyone gains by our participation in continued education.

A. M. Bagaz

Editorials

PRAYER BREAKFAST — 1971

The first prayer breakfast, a great innovation in Delaware, was held recently during the 182nd Annual Meeting of the Medical Society of Delaware. I feel that this represents a giant step forward for the First State in cementing the twin philosophies of medicine and religion.

Historically speaking, these deep emotional disciplines grew up simultaneously, each at times advancing, guarding, or prohibiting the other. Illustrations are numerous in the sacred and lay literature in all the great religious faiths in the world today.

Both disciplines demand of their followers adherence to mental and physical cleanliness. Each calling is dedicated to the well-being of one's fellow man and the uplifting of the human spirit.

It would be most heartwarming if more of our physicians would express themselves in their chosen religious faith because philosophically the basic tenet upon which the elements of human behavior are constructed is the "Golden Rule."

As for physicians, we all at times reach a stage in the treatment of a patient when the prognosis is past cure. The theologian would offer a ready answer — when all else is lost, the physician can always offer hope. Often the physician is the only person present when a patient expires, and it would be a deep-felt privilege for the doctor to wish "God's Speed" to the patient's soul. At times the use of the idea of faith in a Divine Being can bring the patient through a most difficult medical or surgical recovery with a much smoother course.

Fellow physicians, look into yourselves, because it is truly written "The body is the temple of our souls."

A.C.W.

* * *

SPECTINOMYCIN

Spectinomycin* (formerly known as actinospectacin) has recently been made available to the clinician for the treatment of gonorrhea. This antibiotic will be valuable for the *single dose* treatment of gonorrhea in patients who are allergic to penicillin and in patients infected with strains of *Neisseria gonorrhea* that are relatively resistant to penicillin. Spectinomycin is given intramuscularly with the usual dose being 2 gm in male patients and 4 gm in female patients. Male patients suspected of being infected with antibiotic-resistant gonococci should also be given an initial 4 gm dose of the antibiotic. Since 4 gm of spectinomycin with the diluent yields 10 ml intramuscular dose, it is considered preferable to administer the antibiotic in two injection sites.

Though spectinomycin usage is restricted to the treatment of gonorrhea, this antibiotic has broad spectrum activity and was introduced for clinical investigation in various infections in the early 1960's. While the *in vitro* efficacy of this agent was adequate to prompt *in vivo* trials, the *in vivo* activity surpassed that anticipated by *in vitro* studies. Infections of the urinary tract, respiratory tract and blood stream were treated with intramuscular and intravenous spectinomycin with varying degrees of success. This agent appeared most promising in *proteus* infections of the urinary tract.[1] However, the rapid development of *in vivo* resistance and the apparent limited applicability of the drug in clinical medicine led to discontinuance of studies of spectinomycin as a broad spectrum antibiotic.

Early reports[2] of clinical experience with spectinomycin included good results in patients with disseminated gonorrhea, impressing investigators primarily concerned with the treatment of gonorrhea. During the 1960's when the emergence of antibiotic-resistant strains of gonococci became a clinical problem, the Public Health Service in cooperation with the Upjohn Company began the clinical

Continued on page 435

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*Trobicin® Upjohn

Delaware Academy of Family Practice

PSYCHIATRIC SEMINARS

A Seminar Workshop series of twenty sessions (10 in Wilmington and 10 in Dover) for non-psychiatric physicians to improve skills of diagnosis, understanding and management of psychiatric problems will be sponsored by Jefferson Medical College, the Wilmington Medical Center, Inc., and the Delaware Academy of Family Physicians, February 2 through April 5, 1972. The Wilmington Seminars will be held from 2 to 4 p.m. in the Small Conference Room in the maternity section of the Wilmington General Division, Wilmington Medical Center. The Dover Seminars will be held in the Kent General Hospital, from noon to 2 p.m. Approved for 20 hours' AAFP credit for each series.

WILMINGTON PROGRAM

Moderator — David Platt, M.D.

Feb. 2
Psychiatric Program — Jefferson Medical College and Wilmington Medical Center
Floyd S. Cornelison, Jr., M.D.

Feb. 9
Depression and Brief Therapy in a Potential Suicide — Saved in Fifteen Minutes
Nicholas P. Bash, M.D.

Feb. 16
The Psychiatrist's Role in Abortion, Young, Middle & Twilight Years — The Follow-Up
H. George DeCherney, M.D.

Feb. 23
Learning Problems in Children
Chronological Levels vs Maturity or Peer Levels
L. Isobel Rigg, M.D.

March 1
Changing Culture Varies Psychiatric Concepts
The Dilemma of Adoptions and Divorce
Charles Strahan, Jr., M.D.

March 8
Psychiatric Phase of the Emergency Room — and Consultations in a General Hospital
Howard L. Field, M.D.

March 15
The Pill and Psychiatric Behavior of the Adolescent, and Neurotic Interaction in Marriage
Abraham Freedman, M.D.

March 22
Where We are Headed with Lithium Therapy, and the Other Psychotropic Drugs
Walter W. Baker, Ph.D.

March 29
Treatment of Anxiety States —
Is Hypnosis Indicated?
Alessandro Rizzo, M.D.

April 5
Pot and the Drug Problem —
Scientific Studies
Ora R. Smith, M.D.

DOVER PROGRAM

Moderator — Rhoslyn J. Bishoff, M.D.

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H. George DeCherney, M.D.

* * *

SPECTINOMYCIN

Continued from page 432

trials[3,4] that established efficacy of spectinomycin in the treatment of gonorrhea.

Spectinomycin appears to be relatively free from serious side effects other than the discomfort associated with intramuscular administration of a large bolus.

Spectinomycin is an aminoglycoside but does not otherwise resemble other currently available antibiotics. Since it will be utilized as a *single dose agent,* little opportunity for sensitization and allergic reaction should occur. *W.J.H.*

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2. Romansky MJ, Walters WW, Johnson AC, et al: Laboratory and clinical studies on actinospectacin — M 141, a new broad spectrum antibiotic. Antimicrobial Agents 706, 1962.
3. Labowitz R, Porter WL and Holloway WJ: The treatment of gonorrhea with spectinomycin and rifampicin. Del Med Journ 42:353, 1970.
4. Cornelius CE and Domescik GD: Spectinomycin hydrochloride in the treatment of uncomplicated gonorrhea. Brit Journ of Venereal Disease 46: 212, 1970.

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Advertisements under the Classified Ad Section are charged at the rate of 30 words or less, set solid. One insertion $4.00. Call the Journal office, 658-7596 for further information or placement. All advertisements are payable in advance. The Editorial Board reserves the right to edit copy. Closing date for new copy is the first of the month for inclusion in the current issue.

Classified advertisements of a professional nature are free to members.

GASTROENTEROLOGIST and INTERNIST: Completing training June 1972. Interested in group or association. Residency, University of Pennsylvania Medical Center.

UROLOGIST: Will complete residency at Cleveland Clinic and be available July 1972. Graduate, University of Vermont College of Medicine. Military service completed. Alpha Omega Alpha. Interested in private practice in association with one or more urologists.

UROLOGIST and SURGEON: Board-certified in general Surgery. Presently Chief Resident in Urology at University of North Carolina Medical Center. Interested in solo or partnership/association practice.

AMSTERDAM
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SURGICAL, ORTHOPEDIC and PROSTHETIC APPLIANCES
CERTIFIED

In Brief

In the News

The following Delaware physicians have received the AMA Physician's Recognition Award for excellence in continuing medical education (three-year period): Medical Society of Delaware 1969 Recipients — Herbert M. Baganz, M.D., Walter L. Bailey, M.D., Alexander A. Boytar, M.D., Richard F. Brams, M.D., Jerome J. Bredall, M.D., Joachim Ch'ih, M.D., C. Anthony D'Alonzo, M.D., Ronald L. Domingo, M.D., Stephen H. Franklin, M.D., John T. Hogan, M.D., William J. Holloway, M.D., Zakir Hossain, M.D., Ellis M. Kendle, M.D., Kyo A. Kim, M.D., Ivan P. Law, M.D., Jules S. Levin, M.D., Oscar J. Martinez, M.D., John T. Oglesby, M.D., J. Joaquim Palacio, M.D., David Platt, M.D., Ethel F. Platt, M.D., Charles R. Rickards, M.D., Karl A. Semlak, M.D., Alexander Smith, M.D., Eugene J. Szatkowski, M.D., Barrie L. Weisman, M.D., 1970 Recipients — Harry A. Carl, M.D., Arlo J. Courter, M.D., Neil A. de Leeuw, M.D., Richard P. Forlano, M.D., Yu-Jin Lee, M.D., Howard A. Lovett, M.D., Napoleon A. Manubay, M.D., Robert S. Seeherman, M.D.

Speakers on "Ask the Doctor"

Speakers for January 1972 on the Tuesday radio program (11:05 a.m., WDEL) produced by the Medical Society of Delaware are: January 4, Charles L. Minor, M.D., *Solid Tumors in Children;* January 11, William Miller, M.D., *Renal Failure;* January 18, Lee B. Hogan, Jr., M.D., *Smoking and Health;* January 25, Warren R. Johnson, M.D., *Upper Respiratory Infections in Children.*

College of Surgeons Meeting

The Annual Meeting of the American College of Surgeons, Delaware Chapter, will be held at the Delaware Academy of Medicine, January 11, 7 p.m. Shahrokh S. Morovati, M.D. will speak on "The Role of the Young Surgeon in the American College of Surgeons Today." Members are urged to attend.

Books, Books, and More Books

Last year the College of Physicians of Philadelphia Library added about 1000 new books to its catalog. Our own Academy of Medicine purchased about 200 of these. The Delaware Medical Journal would like to publish brief reviews of new books particularly those which members of the Medical Society would like to recommend to their colleagues, or even like to non-recommend. Not every new book is a masterpiece, in medicine as in other fields; many, while not masterpieces, are still very useful. Most members of the Medical Society of Delaware receive each month the list of new acquisitions to the library of the Academy of Medicine. The Academy librarian will be glad to provide any book on his list, or to borrow any new book that he has not purchased, for the purpose of your review. We at the Journal would like to get your review to share with our readers.

DAPI

DAPI (Delaware Adolescent Program, Inc.) has just reviewed its '70-'71 statistics. 161 of the 204 girls registered were from Wilmington public schools. 27 graduated from high school last June; 112 returned to school this September. Data for students outside of Wilmington is not yet available.

THE FORUM

Environment And Health

ENVIRONMENTAL HEALTH

Frank T. O'Brien, M.D.

Since the catastrophic developments affecting Donora, Penna., London, and New York City, the citizens of the United States have become cognizant of the world in which we live and the air which we must breathe. The rhetoric and knowledge are so commonplace that children as well as adults have become informed and concerned. In 1967, Congress passed the Clean Air Act which set the stage for future developments concerning air pollution abatement.

It must be stated that both the citizens of Delaware and the Tuberculosis and Health Society have been involved in clean air for some period of time. The Governor appointed a Water and Air Resources Commission which is composed of the following members: Chairman, Walter Kabis, members, Messrs. Wayne Kneisley, A. J. Maitland, Harold Jacobs, Harvey Spicer, Grover Biddle, William Carter, Dr. Robert Jordan and myself. As you see, these individuals represent the three counties of the state as well as the city of Wilmington. The Commission must establish air quality standards and effect an implementation plan so that the ambient air will not become a health hazard.

It is of recent origin that researchers have discovered that photo-chemical oxidents, sulphur oxides and particulate matter directly cause disease in animals. The Commission's philosophy is to help industry meet the standards established by the Environmental Protective Agency, then gradually reduce the effluent to prevent future contamination in areas that are now comparatively pollutant free. There is no easy, quick, or non-traumatic way. The magnitude of the problem dictates that we progress slowly, diplomatically and prudently.

Mr. Austin Heller, the Secretary of the Department of Natural Resources and Environmental Control, has extensive management experience in this field, which will lessen the strain on the Commission, the Council and particularly on the Governor.

After the ambient air standards have been approved and the air quality has been monitored both at random stations and at every industrial stack, we know that the atmospheric inversions will not be followed by respiratory distress syndromes.

Mr. Robert French, the Air Resources manager, has an office at 14 Ashley Place, Richardson Park, Wilmington. This is just off Maryland Avenue near Five-Corners. At this installation, there are tabulators of the New Castle County monitoring systems; the data is to be correlated with morbidity and mortality rates of respiratory disease in New Castle County.

The physicians of Delaware, the Tuberculosis and Health Society, and the Delaware Citizens for Clean Air are very much involved in "It's a Matter of Life and Breath."

Dr. O'Brien is a Thoracic Surgeon, practicing in Wilmington, Delaware.

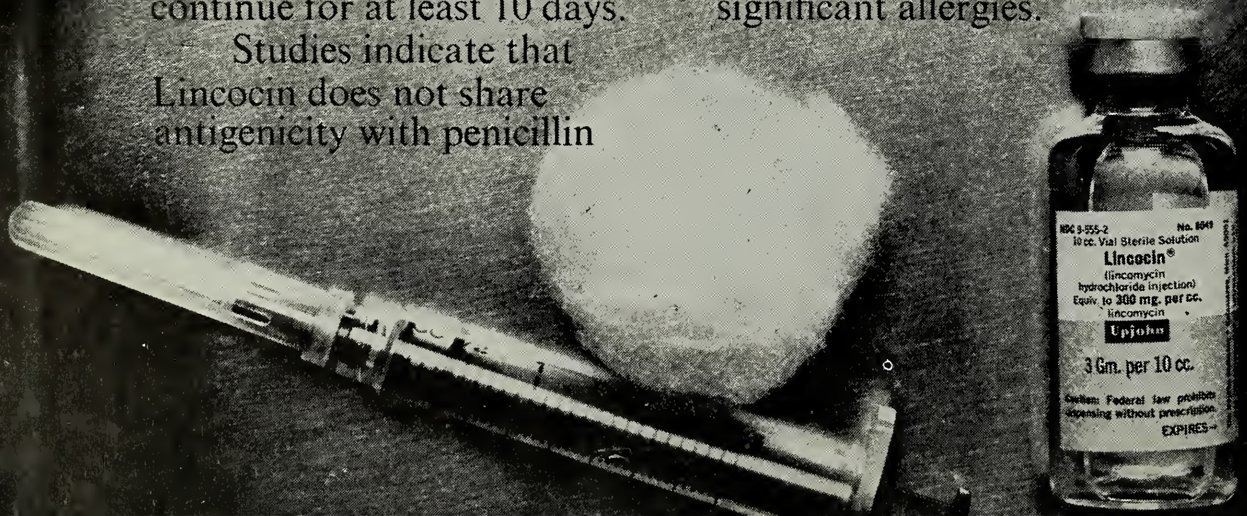
This page is sponsored by the Delaware Tuberculosis and Health Society.

Hypersensitivity to penicillin is a good reason to consider Lincocin®

(lincomycin hydrochloride)

Lincocin (lincomycin hydrochloride, Upjohn) has produced a high percentage of satisfactory responses in patients with mild, moderate and severe infections due to susceptible streptococci, pneumococci and staphylococci (including many penicillinase-producing strains). With β-hemolytic streptococcal infections, treatment should continue for at least 10 days.

Studies indicate that Lincocin does not share antigenicity with penicillin compounds. However, hypersensitivity reactions such as angioneurotic edema, serum sickness and anaphylaxis have been reported, some of these in patients known to be sensitive to penicillin. As with any antibiotic, Lincocin (lincomycin hydrochloride, Upjohn) should be used cautiously in patients with histories of asthma or other significant allergies.


10 cc. Vial Sterile Solution
Lincocin®
(lincomycin hydrochloride injection)
Equiv. to 300 mg. per cc. lincomycin
Upjohn
3 Gm. per 10 cc.
Caution: Federal law prohibits dispensing without prescription.
EXPIRES→

FOUNDED
1776

INCORPORATED
1789

MEDICAL SOCIETY OF DELAWARE

- BY-LAWS
- CHARTER
- PRINCIPLES OF MEDICAL ETHICS

Including Revisions Through 1970

PRINCIPLES OF MEDICAL ETHICS

American Medical Association

Preamble

These principles are intended to aid physicians individually and collectively in maintaining a high level of ethical conduct. They are not laws but standards by which a physician may determine the propriety of his conduct in his relationship with patients, with colleagues, with members of allied professions, and with the public.

Section 1.

The principal objective of the medical profession is to render service to humanity with full respect for the dignity of man. Physicians should merit the confidence of patients entrusted to their care, rendering to each a full measure of service and devotion.

Section 2.

Physicians should strive continually to improve medical knowledge and skill, and should make available to their patients and colleagues the benefits of their professional attainments.

Section 3.

A physician should practice a method of healing founded on a scientific basis; and he should not voluntarily associate professionally with anyone who violates this principle.

Section 4.

The medical profession should safeguard the public and itself against physicians deficient in moral character or professional competence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5.

A physician may choose whom he will serve. In an emergency, however, he should render service to the best of his ability. Having undertaken the care of a patient, he may not neglect him; and unless he has been discharged he may discontinue his services only after giving adequate notice. He should not solicit patients.

Section 6.

A physician should not dispose of his services under terms or conditions which tend to interfere with or impair the free and complete exercise of his medical judgment and skill or tend to cause a deterioration of the quality of medical care.

Section 7.

In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him, or under his supervision, to his patients. His fee should be commensurate with the services rendered and the patient's ability to pay. He should neither pay nor receive a commission for referral of patients. Drugs, remedies or appliances may be dispensed or supplied by the physician provided it is in the best interests of the patient.

Section 8.

A physician should seek consultation upon request; in doubtful or difficult cases; or whenever it appears that the quality of medical service may be enhanced thereby.

Section 9.

A physician may not reveal the confidences entrusted to him in the course of medical attendance, or the deficiencies he may observe in the character of patients, unless he is required to do so by law or unless it becomes necessary in order to protect the welfare of the individual or of the community.

Section 10.

The honored ideals of the medical profession imply that the responsibilities of the physician extend not only to the individual, but also to society where these responsibilities deserve his interest and participation in activities which have the purpose of improving both the health and the well-being of the individual and the community.

CHARTER OF THE MEDICAL SOCIETY OF DELAWARE

ACT OF INCORPORATION

In the Thirteenth Year of the Independence
of the Delaware State.

An Act to Incorporate the Physicians of Delaware, and for other purposes therein mentioned.

Whereas, The practice of medicine is of acknowledged and extensive benefit to society, and therefore ought to be promoted and encouraged, and

Whereas, It is of great consequence that the same should be conducted on some permanent establishment of regularity and permanent utility; for the purposes whereof:

Section 1. Be it enacted by the General Assembly of the Delaware State, that the following persons now resident physicians of this State, to wit, John McKinley, Nicholas Way, Jonas Preston, Ebenezer Smith, George Monro, Thomas McDonough, Joshua Clayton, Ezekiel Needham, James Tilton, William Molleston, Edward Miller, James Sykes, Nathaniel Luff, Robert Cook, Matthew Wilson, Joseph Hall, John Marsh, John Polk, John Stephens Hill, Julius Augustus Jackson, William McMechen, Henry Latimer, James McCalmont, Joseph Capelle, Archibald Alexander, Henry Peterson and Levarius Hooker Lee, are hereby authorized and empowered, at any time after the second Monday in May next, to meet together at the town of Dover, in the County of Kent, or other convenient place, and being so assembled to the number of six or more, elect and choose by a plurality of voices then present, a President and such other officers as to a majority shall appear proper and necessary for the convenience and government of the same; which said President and such other officers as aforesaid so elected, together with all and every the persons aforesaid named, are hereby made and constituted a body politic and corporate to all intents and purposes in this Act expressed in deed and in law forever, by the name and title of The President and Fellows of the Medical Society of Delaware; and by that name and title shall be known and called, and have perpetual succession.

Section 2. And be it further enacted by the authority aforesaid, that the said corporation be and shall hereafter be capable in law to sue and be sued, implead and be impleaded, answer and be answered unto, defend and be defended in any of the courts of law, or equity, or any other place whatsoever, and to do and execute all and singular the matters and things which bodies politic and corporate lawfully may do.

Section 3. And be it enacted, that the President and Fellows are hereby authorized to hold one annual stated meeting at any place which by them may be deemed convenient within this State, and at every such annual stated meeting elect and choose in such manner as to the majority of those assembled may seem meet, a President and all and every other officer and officers, the same being Fellows of the same society, as shall appear proper and necessary as aforesaid, to serve in their respective offices, which they may be respectively appointed to for the year ensuing, and until the next annual stated meeting of the corporation as aforesaid; and the said corporation is hereby further authorized and empowered at any and all times of their meeting and assembling together, duly and conformably to such regulations as they shall make or enter into respecting the same, to elect, choose and admit into the said corporate body, Fellow or Fellows in such manner, and under such restrictions and qualifications of the person or persons standing candidate for such fellowship, and so proposed to be admitted thereto, as shall or may be hereafter directed and allowed by any regulations, acts, or ordinances of the said corporation respecting the same.

Section 4. And be it enacted, that the President and officers of the said corporation, who may be elected in virtue of the powers by this Act granted, or which at any time hereafter they may be legally invested with, shall keep and hold their respective offices, and shall continue and be fully and to all intents and purposes the President and officers of the said corporation, until others shall be appointed in virtue of any of the powers granted by this Act.

Section 5. And be it further enacted, that the President and Fellows of the said corporation shall be capable of exercising such powers for the government and ordering of said corporation, and of holding at all and any time and place such occasional meetings for that purpose, as have been, or may hereafter be, fixed or adopted with the rules or regulations which may legally be entered into by the said corporation.

Section 6. And be it further enacted, that the said corporation shall and may make, ordain, and establish any such laws, regulations and ordinances as to them may seem proper and necessary for the well ordering and governing the said corporation, provided always nevertheless, that nothing in this Act contained shall be taken or construed to authorize the said corporation to enter into any regulations or ordinances, or to exercise any powers contravening, repugnant, or contrary to the laws and Constitution of the State.

Section 7. And be it futher enacted, that the said corporation shall have full and complete power and authority to make, have, and use a common seal, and at any time to break and alter the same, and establish another or others with such device or devices as they shall think proper; and that all which shall or may be certified under said seal, or under any other seal of the said corporation, shall have full faith and credit in all and every the courts of law in this State.

Signed by order of the House of Assembly.
JEHU DAVIS,
Speaker.
Signed by order of the Council.
NICHOLAS VANDYKE,
Speaker.
Passed at Dover, February 3, 1789.

In pursuance of the foregoing Act, the preliminary Convention of Physicians which met in Dover, May 12, 1789, resolved itself into "The President and Fellows of the Medical Society of Delaware," and adopted regulations and ordinances (By-Laws), and now

Whereas, these By-Laws have not been revised since 1923, and whereas it has long been evident that new By-Laws were necessary, now be it

Resolved, In behalf of the President and Fellows of the Medical Society of Delaware, in annual convention met at Wilmington, Delaware, on this 10th day of October 1949, that we adopt the following By-Laws, subject to confirmation by the House of Delegates at Dover, Delaware, on the 5th day of December, 1949.

BY-LAWS

ARTICLE I

NAME

The name of this organization is the Medical Society of Delaware.

ARTICLE II

OBJECTS

The objects of this Society are to promote the science and art of medicine and the betterment of public health.

ARTICLE III

MEMBERSHIP

Section 1

CLASSES OF MEMBERSHIP

This Society consists of (a) active members, (b) associate members, (c) honorary members, (d) affiliate members.

Section 2

ACTIVE MEMBERS

Every physician duly licensed and registered in the State of Delaware to practice medicine in all its branches, who is of good moral character and professional standing and an active member in good standing of his component society shall be eligible for active membership, provided from whom or on whose behalf the required annual dues or special assessments have been received timely by the treasurer of the society. Active membership in the State Society is mandatory for active members in a component society.

Section 3

ASSOCIATE MEMBERS

Associate members may be members of the medical profession on duty with the armed forces of the United States, governmental service at any level or those engaged in the practice of industrial medicine and physicians who are in the active practice of medicine in all its branches but who are not citizens of the United States. Associate members have all rights and privileges of active members, and must be members in good standing of a component county medical society.

Section 4

HONORARY MEMBERS

The honorary members are all those active members who have been in good standing in this Society or other component societies for thirty years or more and who are seventy or more years old. Honorary members have all the rights and privileges of active members, but they shall not be subject to the payment of annual dues and special assessments.

Section 5

AFFILIATE MEMBERS

Affiliate members may be medical students, interns, and residents in an accredited educational program recognized by this Society. They will have rights, privileges, and responsibilities of active members, except holding office.

Section 6

RIGHTS OF MEMBERS

Active and honorary members who are in good standing are entitled to all the rights, benefits and privileges of this Society, including the right to register at sessions of the Society, to attend and participate in the general meetings held therein, to vote, to hold office, subject to the qualifications set by these By-Laws for particular offices, to serve on committees, and to receive a copy of the Society's official publication as issued. When a member resigns or loses his membership in a component society or dies, he or his estate, as the case may be, forfeits all right and title to any share in the privileges and property of this Society.

Section 7

GOOD STANDING

A member is not in good standing within the meaning of these By-Laws:

(a) unless in the case of an active member payment of dues and special assessments on his behalf have been received by the Treasurer as provided in these By-Laws;

(b) if he has been suspended or expelled by his component society regardless of whether he has pending an appeal from such disciplinary order to the Council of this Society or to the Judicial Council of the American Medical Association; or

(c) if his license to practice in this or any other state has been revoked or suspended and has not been subsequently restored on appeal, unless such revocation or suspension be due solely to non-payment of an annual registration fee in some state other than Delaware.

Section 8

DUES AND SPECIAL ASSESSMENTS

On or before January 1 of the year for which the dues in question are payable, each active and associate and affiliate member shall pay annual dues to the Society in an amount to be determined annually by the House of Delegates. Said dues shall be paid to the treasurer of the member's component society, who shall by the tenth of each month forward to the Treasurer of this Society dues collected from members during the preceding month. Any member with respect to whom dues for that year have not been received by the Treasurer by April 1 shall, after verification of said delinquency, be suspended from membership in this Society until such time as the current dues are received, and the records of the Society's central office with respect to the payment of dues shall be prima facie evidence of the correctness of the facts stated therein. The dues of a physician newly elected to active membership in a component society after July 1, shall for the year of his election be one-half of the annual dues for a member of his class.

Special assessments may be levied by vote of two-thirds of the members of the House of Delegates present and voting at a meeting provided that notice of said proposed assessments shall have been mailed to each member of the House of Delegates five days prior to the meeting at which action on the proposed assessment is to be taken. Special assessments shall be due and payable within sixty days of the vote to assess and a member delinquent in the payment of such special assessment shall not be deemed to be in good standing.

Active members of the Society shall be excused from payment of annual dues and special assessments of this Society as long as they are on active duty with the armed forces of the United States. Said members shall pay the dues for the year in which they are inducted into service but shall not pay the dues for the year in which they are mustered out.

Active members of this Society who retire from practice before the age of seventy and who derive no part of their income from the practice of medicine shall be excused from the payment of annual dues or special assessments of this Society, provided they are similarly excused from payment of dues and assessments of their component county societies.

ARTICLE IV

COMPONENT SOCIETIES

Section 1

DEFINED

The component societies of this Society consist of those medical societies representative of the medical profession of a county which hold charters from this Society that are in full force and effect.

Section 2

CHARTERS

(a) All charters issued by this Society continue in full force and effect until revoked as provided hereafter. This Society, however, shall have the right, without revoking a charter, to suspend some or all of the rights and privileges of a component society for the causes and in the manner hereinafter provided.

(b) The Board of Trustees, with the approval of the House of Delegates, may charter as a component society a medical society representative of the medical profession of a county as circumstances may dictate or as seems desirable.

(c) The Board of Trustees may, in its discretion, revoke the charter of or suspend any or all of the rights of a component society which, in the opinion of the Board of Trustees

(1) fails to pay prior to April 1 annually the assessments, regular or special, levied on its members;

(2) fails to investigate any charges preferred against any of its members which, if true, would be cause for society discipline, or fails to institute or to conduct in a proper manner disciplinary proceedings where a complaint has been filed in proper manner and form;

(3) fails to execute a disciplinary sentence imposed on a member as a result of disciplinary proceedings conducted in accordance with the requirements of these By-Laws;

(4) wilfully refuses or fails to obey or follow policy, rule of conduct, or course of action regularly and validly enunciated by the House of Delegates, whether appearing in these By-Laws or by resolution or otherwise; or

(5) commits any act which is contrary to or inconsistent with the objects of this Society.

The Board of Trustees shall have jurisdiction to revoke a charter or to suspend any or all of the rights of a component society only if

(1) a hearing is held at which the accused society has a full and complete opportunity to be heard in its own defense;

(2) at least two weeks prior to the hearing notice is given to the affected society as to the time and place of the hearing and as to the alleged derelictions of the society which will be the subject of the hearing; and

(3) two-thirds or more of the Board of Trustees vote to suspend the rights or privileges or to revoke the charter of the affected society. The Board of Trustees in its decision may provide conditions under which the affected society will be restored to good standing in this Society and can resume the exercise of all rights and privileges of component societies.

A component society whose rights or privileges or whose charter has been suspended or revoked by the Board of Trustees shall have the right to appeal to the House of Delegates at its next session and the decision of the House of Delegates, delegates from the affected society not being permitted to vote on the matter, shall be final. Pending the determination of the House of Delegates, the decision of the Board of Trustees shall be given full force and effect.

Section 3

QUALIFICATION OF MEMBERS

Subject to the provisions of Section 4 of this article, each component society is the sole judge of the qualifications of its members and the acceptance of applicants is wholly at the pleasure of the component society. A component society may create classes or types of membership in addition to the types of membership of this Society but only such members of the component society as possess the qualifications required by these By-Laws are members of this Society.

Section 4

LIMITATIONS

Component societies are subject to the following limitations:

(a) The By-Laws of this Society, and the amendments thereto that may be adopted in the future, are the supreme law of the component societies. Insofar as the constitution or by-laws of a component society are contrary to or inconsistent with the By-Laws of this Society, the constitution or by-laws of the component society are void and of no effect.

(b) The constitution or by-laws, or any amendments thereto, of a component society shall not become effective until approved by the Board of Trustees of this Society. If a proposed constitution or by-laws or any amendments thereto are disapproved by the Board of Trustees, the affected society may appeal to the House of Delegates at its next regular session and the Board of Trustees must act on the matter according to the instructions of the House.

(c) A component society may admit to active membership or continue in such membership only such citizens of the United States as (1) are licensed to practice medicine and surgery in all its branches in the State of Delaware; (2) reside or practice in the territorial jurisdiction of the society, except as the By-Laws of this Society may otherwise provide; (3) abide by the Code of Ethics of the American Medical Association, and (4) do not practice or claim to practice any system of sectarian medicine or healing.

(d) A component society may expel, suspend, censure, or otherwise discipline a member for such causes and under such procedure as is stated in the society's constitution and by-laws, provided a copy of the charges preferred against the member is served on him, he is given at least ten days to prepare his defense, and a hearing is held on those charges at which he is afforded a full opportunity to be heard in his own defense, to present witnesses and other evidence in his behalf and to cross-examine witnesses and to rebut evidence presented to sustain the charges. However, a component society, if its constitution or by-laws so provide, may suspend from membership any member in arrears with respect to dues for four months or more, and may expel such member if said delinquency has existed for one year and four months, without giving notice or holding a hearing as above provided. A member against whom disciplinary action has been voted by a component society shall have the right to appeal to the Board of Trustees of this Society and eventually to the Judicial Council of the American Medical Association under such rules as those two bodies may adopt. However, the disciplinary action voted by the component society shall remain in full force and effect during the pendency of such appeal or appeals.

Section 5

DELEGATES AND TRUSTEES

(a) Each component society is entitled at an appropriate annual meeting to elect one delegate and one alternate to the House of Delegates of this

Society for each ten members, or major fraction thereof, of the component society who are members of this Society. Regardless of the total number of active members, each component society is entitled to elect at least one delegate and one alternate. Only persons who have been members in this society for two or more years immediately and continuously preceding their election are eligible for election as delegates or alternates. The delegates and alternates shall be elected for two year terms. If a component society so desires, it may elect one-half of its delegates and alternates each year.

Component societies shall elect trustees for two-year terms beginning January 1st, next ensuing. Each component society is entitled at an appropriate annual meeting to elect one Trustee for each one hundred members, or fraction thereof, of the component society who are members of this Society. Regardless of the total number of active members, each component society is entitled to elect at least two trustees.

(b) The secretary of a component society must give the active members of that society at least ten days' written notice of the time and place of the holding of the annual meeting at which officers, delegates and trustees will be elected. Within ten days after the holding of the annual meeting and its resulting elections the secretary of the component society shall certify the results of the election to the Secretary of this Society. On or before April 1 annually the secretary of each component society shall send a list of delegates and trustees from the society to the Secretary of this Society.

(c) If a delegate or trustee elected by a component society dies, resigns, ceases to be a member in good standing of the society, becomes disabled, or for any other reason cannot assume the duties of his office, or will be absent from the session of the House of Delegates of this Society, the president of the component society may appoint another active member to serve in his stead during the balance of the term or during the disability or absence, as circumstances may call for. As soon as practicable after the appointment, the president of the component society shall notify the Secretary of this Society of his action.

Section 6

DUTIES OF THE SECRETARY AND TREASURER

The secretary of each component society shall keep a roster of its members, grouping the members according to type of membership held. With respect to each member, the roster shall contain the full name, address, date of birth, professional college and date of graduation, the date the physician was licensed to practice in this state, and such other information as the Secretary of this Society may require. The Secretary shall also keep a list of licensed physicians practicing within the jurisdiction of the society who are not members. In keeping such records the secretary shall note any change in the personnel of the profession by death or by removal and shall so notify the Secretary in such form as he may require. The treasurer shall forward by the tenth of each month to the Treasurer of this Society dues and assessments collected from members in the preceding month, together with such data as may be required by the Society. He shall promptly notify the Secretary of losses of membership, giving the causes in individual cases.

Section 7

MEMBERSHIP IN SOCIETY OF COUNTY OTHER THAN THAT OF RESIDENCE

Any physician living on or near a county line may be elected to membership in that component society whose meetings will be most convenient for him to attend, if the action is agreeable to the component society embracing the county in which the physician resides.

Section 8

MEMBERSHIP WHERE MAJOR OFFICE AND RESIDENCE ARE IN DIFFERENT COUNTIES OR DISTRICTS

Any physician, who has his major office or professional practice in one county and resides in another county, has the option of applying for membership in the component society having jurisdiction of either county, if the action is agreeable to both affected component societies.

Section 9

MEMBERSHIP AS AFFECTED BY TRANSFER OF RESIDENCE

A member who changes his residence from the county through whose component society he holds membership in this Society, to another county in which there is a different component society, is eligible for membership in the component society of his new residence on the presentation of a transfer card, and satisfactory evidence that his dues have been paid in full and that he is otherwise in good standing in the component society in which he holds membership. Such a member, however, shall lose membership in this Society six months after such a change of residence unless he makes proper application and is accepted for membership in the society of the county to which he has moved.

Section 10

TRANSFER CARDS

When a member in good standing in a component society moves to another county he shall, on request, be given a transfer card without cost. He must assume such financial obligations as shall be deemed proper by the component society to which he is transferred, and to which he makes application for membership by transfer. The name of a physician requesting a transfer card shall be retained on the original roster until notice of his admission to another component society shall have been received, except that if such notification is not received within six months of the issuance of the transfer card his membership in such component society shall cease.

ARTICLE V

EXECUTIVE OFFICERS

Section 1

NAMED

The executive officers of this Society are the President, Vice President, President-Elect, Secretary, Treasurer, and Executive Director. The Executive Director shall be a member ex-officio without vote of all standing and special committees. He shall not be subject to the rules of qualification, election and tenure that apply to other officers within these By-Laws.

Section 2

QUALIFICATIONS

Only a person who has been a member in good standing of this Society for at least three years immediately preceding his election is eligible for election as an executive officer of this Society. Any person known to have solicited votes for or sought after any office within the gift of this Society shall be ineligible for any office within two years after the commission of said offense.

Section 3

ELECTION AND TENURE

At the general meeting, as the last order of business before the adjournment of the morning meeting of the last day of the annual session, the members present and voting thereat shall elect the President and President-Elect, the year of the adoption of these By-Laws, and thereafter shall elect the President-Elect for the ensuing year. The House of Delegates at the annual session shall elect for the ensuing year all the other executive officers listed. All executive officers shall assume office at the conclusion of the annual meeting, and shall serve until the corresponding session of the following annual meeting.

Section 4

VACANCIES; HOW FILLED

If before the expiration of the term for which he was elected the President dies, resigns, is removed or becomes disqualified, the Vice President shall succeed to the office vacated with all the prerogatives and duties pertaining to the office as though he had been elected President in the first instance. Vacancies created by the death, resignation or removal of executive officers and vacancies in contingencies not here provided for shall be filled by election by the House of Delegates for the unexpired portion of the term.

Section 5

DUTIES IN GENERAL

In addition to the rights and duties provided elsewhere in these By-Laws or as custom or parliamentary usage may require, the executive officers shall have the rights and duties respectively assigned to them in the succeeding sections of this article.

Section 6

PRESIDENT

The President shall be the chief executive officer of the Society. It shall be his duty to preside at all general meetings of the society, of the Board of Trustees and of the House of Delegates; to have general and active management of the business of the Society; to see that all orders and resolutions of the Society, House of Delegates and Board of Trustees are carried into effect; to execute all contracts and agreements authorized by the Society, House of Delegates or Board of Trustees; to make such appointments of personnel as are authorized and to act as official spokesman of the Society; to deliver an address at such time as may be arranged; to act as the real head of the profession in the state and to visit personally at least once during his term of office each component society; to assist the Trustees in building up the component societies and making their work more practical and useful; to serve as a member of all standing and special committees; to make an annual report to the House of Delegates; and to appoint all committees not otherwise provided for.

Section 7

VICE PRESIDENT

The Vice President shall assist the President in the discharge of his duties and shall officiate for him during his absence or at his request. The Vice President shall serve as the Chairman of the Commission on Scientific Affairs.

Section 8

PRESIDENT-ELECT

The President-Elect shall assist the President in the discharge of his duties and may officiate for him during the absence of the President and the Vice President. The President-Elect shall be prepared to assume the responsibilities of the presidency without delay upon the expiration of the President's term.

Section 9

SECRETARY

The following rights and duties devolve on the Secretary: (1) To keep minutes in separate record books of the proceedings of the general meetings of the Society, of the meetings of the Board of Trustees, and of the meetings of the House of Delegates; (2) to be the custodian of the Society's seal; (3) to notify members of meetings, officers of their elections, committees of their appointments and duties, and to send all notices required by these By-Laws or by the order of the House of Delegates or the Board of Trustees, or by law; (4) to keep a register of all component societies, their respective officers, and of all members of the society and to transmit a copy of this list to the American Medical Association, notifying the Secretary of the American Medical Association monthly of the names of new members and the names of those dropped from the membership register during the preceding month; (5) to provide for the registration of members and delegates at sessions of the Society and of the House of Delegates and to keep a record of such registration; (6) to keep a card index and register of all licensed practitioners of the State by county, noting the status of each in relation to the proper component society; (7) to be the custodian of all record books and papers of the Society except such as properly belong to the Treasurer; (8) to serve as Secretary of the Board of Trustees and as a member of the Committee on Publication; (9) to report annually to the House of Delegates; (10) to prepare and issue all programs as may be directed by the Committee on Program; (11) to aid the Board of Trustees in the organization and improvement of the component societies and in the extension of the usefulness of this Society; (12) to supply each component society with the necessary blanks for the making of their annual reports and to distribute printed copies of new and amended By-Laws to members; (13) to perform such other duties as may be required by the Board of Trustees or House of Delegates; and (14) to serve as Chairman of the Commission on Public Affairs.

Section 10

TREASURER

The following rights and duties devolve on the Treasurer: (1) To serve as a member of the Board of Trustees and of the House of Delegates; (2) to charge on the books of this Society the dues of each member and to demand and receive all funds due the Society, including bequests and donations, to deposit same in a depository approved by the Board of Trustees and to keep an accurate record thereof as well as of funds disbursed by the Society; (3) to pay money out of the treasury only on the written order of the President, countersigned by the Secretary or by order of the House of Delegates or the Board of Trustees; (4) under the supervision of the Board of Trustees to invest the funds under his care; (5) after receiving the recommendation of the Board of Trustees, to sell, mortgage, or lease any property belonging to the Society and to execute the necessary legal documents therefor; (6) to subject his accounts to such annual examination as the Board of Trustees may order; (7) to render an account of his work and of the funds in his hands to the House of Delegates; and to make in writing such other reports as the House of Delegates or the Board of Trustees may require; and (8) to give bond in such sum as may be fixed by the Board of Trustees, the premium on such bond to be paid by the Society.

ARTICLE VI

HOUSE OF DELEGATES

Section 1

GENERAL POWERS

All legislative powers of the Society, including the power to alter, amend or repeal these By-Laws, is vested in and resides in the House of Delegates, which alone shall have authority to determine the policies of the Society, except as action may be taken by virtue of a referendum of the members of this Society as provided in Article IX, Section 2. It shall elect (1) all the executive officers, except the President, and President-elect, (2) such delegates to the American Medical Association as the Society may be entitled to, and (3) the standing committeemen.

Section 2

COMPOSITION

The House of Delegates shall be composed of (1) delegates elected by the component societies, each component society being entitled to elect one delegate for every ten active members in good standing as of June 1st, or major fraction thereof, provided each component society shall be entitled to elect at least one delegate; (2) the President, Vice President, President-Elect, Secretary, Treasurer, all Past Presidents and the elected Trustees.

Section 3

QUALIFICATIONS

No member may be seated in the House of Delegates unless he has been a member in good standing of this Society for the two years immediately preceding.

Section 4

CONDUCT OF BUSINESS

The House of Delegates in its deliberations shall be presided over by the President, and in his absence by the Vice President, and in the absence of these persons, by any delegate agreeable to it. Fifteen members shall constitute a quorum for the transaction of business. The Secretary shall record the proceedings. The House in its meetings, whether in regular or special session, shall proceed with the order of business set by the Secretary. At any meeting, however, the House by specific motion may change the order of business previously set by the Secretary and proceed thereunder in accordance with the terms of the motion.

Section 5

TIME OF MEETING

The House of Delegates shall meet in regular session on the first day of the annual session and may adjourn from time to time as may be necessary to complete its business provided that the hours of meeting shall conflict as little as possible with the general meetings. It shall meet during special sessions in accordance with the terms of the call.

A special meeting of the House of Delegates may be called by the President in his discretion, and must be called by him on the written petition of the Board of Trustees, or of ten members of the House of Delegates, or of twenty-five members of the Society.

Section 6

VACANCIES DURING MEETING

If any component society is without representation at the close of the roll call of any meeting of the House of Delegates, the members registered in attendance from that component society may select from among themselves a number equal to the number of delegates to which the component society is entitled and the persons so selected shall act and function as delegates at that meeting.

If, at the close of a roll call, a delegate be absent and his alternate be present, said alternate shall be seated for that meeting of the House of Delegates and any adjourned meeting thereof, even though the delegate later be present.

Section 7

SPECIAL COMMITTEES

The House of Delegates may appoint committees composed of any members of the Society for special purposes, or it may provide for such committees and authorize the appointment by the President of members of the Society to such committees. Such committees annually, prior to the annual session, shall place in the hands of the Secretary for transmittal, to the House of Delegates, a report in writing of their activities during the year, and members of such committees may participate in discussion and debate relative to their reports but unless committeemen are delegates they shall not have the right to vote.

Section 8

NOMINATION OF MEDICAL EXAMINERS

Not later than the last day of each calendar year, the House of Delegates shall submit the names of ten members of the Society to the Governor of the State recommending to the Governor that he fill vacancies on the Board of Medical Examiners from the names so submitted.

Section 9

FUNDS, ANNUAL DUES AND SPECIAL ASSESSMENTS

The House of Delegates shall have final control of all funds and investments of this Society except as a specific deed of trust or bequest may provide otherwise. If it deems the course expedient, it may designate an annual per capita assessment for the ensuing year different in sum than that provided by Article III, Section 8 of these By-Laws, and it may, if it deems the action necessary or advisable, levy in addition a special per capita assessment.

Section 10

REPORTING OF PROCEEDINGS

The Secretary shall cause a summary of the proceedings of the House of Delegates to appear as soon as practicable after a meeting in the Society's official publication.

Section 11

MEMORIALS AND RESOLUTIONS

No memorial or resolution can validly be issued in the name of this Society unless adopted by the House of Delegates.

Section 12

REPORTS OF OFFICERS

All officers, the Board of Trustees, and the chairmen of all committees shall prepare and submit for the consideration of the House at the annual session reports in writing concerning their activities during the past year.

ARTICLE VII

BOARD OF TRUSTEES

Section 1

GENERAL POWERS

The Board of Trustees shall carry out the mandates and policies of this Society as determined by the House of Delegates or by referendum or initiative measures. Subject only to the provisions of (1) these By-Laws, (2) resolutions or enactments of the House of Delegates, and (3) measures adopted by initiative or referendum among the voting members of the Society, the Board of Trustees has full and complete power and authority to perform all acts and to transact all business for the Society and to manage and conduct all of the property, affairs, work, and activities of the Society. The Board of Trustees shall authorize the employment and define the duties of the executive director. The executive director shall be responsible for the administration and duties of the staff.

Section 2

COMPOSITION

The Board of Trustees shall consist of (1) the Trustees elected by the component societies, and (2) the President, Vice President, President Elect, immediate Past President, Secretary, Treasurer, Delegate to the American Medical Association, and the Editor of the Society's official publication.

Section 3

MEETINGS

The Board of Trustees shall meet on the day preceding the annual session and daily during the annual session and at such other times as necessity may require. The President may call a meeting of the Board of Trustees on his own motion and must call a special meeting on the written request of three members of the Board of Trustees. Five members shall constitute a quorum. The President shall preside at the meetings of the Board of Trustees and in his absence the Vice President shall preside and in his absence any member of the Board of Trustees agreeable to it may preside.

Section 4

DUTIES

In addition to the duties and powers conferred on the Board of Trustees elsewhere in these By-Laws, the Board of Trustees shall act as the board of censors or as the arbiter of the Society with respect to matters of ethics and questions involving the rights and standings of members, whether in relation to other members, to the component societies, or to this Society. When its jurisdiction is invoked as hereinafter provided, it shall review instances in which disciplinary orders or measures have been adopted by a component society against a member.

Section 5

DUTIES OF INDIVIDUAL TRUSTEES

Each elected Trustee shall be the judicial representative of this Society in the district from which he was elected. He shall inquire into the condition of the profession and endeavor to improve and increase the zeal of his component society and its members. He shall report promptly the proceedings of the Board of Trustees to his component society. He shall make annual report of his work, and of the condition of the profession in his county or district to the Board of Trustees prior to its annual meeting.

Section 6

MEDICAL DEFENSE

Under such terms and conditions as the Board of Trustees may prescribe or determine the Board of Trustees shall perform the functions discussed in this section. When requested it may investigate all reported claims against members of this Society for compensation for injuries alleged to have resulted from malpractice. It shall determine as nearly as may be practicable the circumstances leading up to the making of the claim itself and the grounds on which the claim is based. If the Board of Trustees believes the claim unjust, it shall cooperate, so far as it lawfully can do so, with the member against whom the claim has been made and with his counsel. If the Board of Trustees believes that a claim is a just claim, it shall cooperate with the member against whom the claim is made and with his counsel, so far as it lawfully can do so, in effecting an equitable settlement.

Each year, out of the funds of the Society, a sum not to exceed one dollar for each member may be set aside by the House of Delegates as a special fund to enable the Board of Trustees to perform the duties imposed on it by this section.

Section 7

BENEVOLENCE FUND

Each year out of the funds of this Society a sum not to exceed one dollar for each member may be set aside by the House of Delegates as a special fund to be known as the Medical Benevolence Fund. This fund shall be kept separate from other monies and may be invested by the Treasurer under the direction of the Board of Trustees. It shall be used, under the direction of the Board of Trustees, only for the relief of pecuniary distress of sick or aged members of this Society, or of the parents, widows, widowers, or children of deceased members.

ARTICLE VIII

COMMISSIONS

Section 1

COMPOSITION

There shall be two commissions, to be known as the Commission on Public Affairs and the Commission on Scientific Affairs. Each Commission shall be composed of the Chairmen of those Committees of the Society whose functions are judged by the President to be primarily scientific or primarily socio-economic. All committees will be represented on one commission only, except that the Committee on Nominations and the Committee on the Budget will be represented on both. The Secretary shall be chairman ex-officio of the Commission on Public Affairs, and the Vice President shall be chairman ex-officio of the Commission on Scientific Affairs.

Section 2

DUTIES

It shall be the duty of each Commission to: (1) Serve as a planning committee and committee on committees for those activities of the Society within its field of study; (2) serve as a reference committee within its field of study, for the House of Delegates; (3) meet not less than three times each year to review and project the work of the Society within its field of study; (4) delineate policy and program within its field of study, subject to the approval of the House of Delegates and/or the Board of Trustees; (5) coordinate the activities of ating authority of the House of Delegates or the Board of Trustees; (5) coordinate the activities of the committees within each Commission.

Section 3

DUTIES OF COMMISSIONS WHEN ACTING AS REFERENCE COMMITTEES

Each Commission shall hold itself available for one meeting during the week preceding the Annual Meeting, to serve as a reference committee for the House of Delegates. The President shall refer all resolutions to be presented to the House of Delegates to one of the two Committees, as he thinks appropriate, and each committee must report to the House of Delegates, favorably or unfavorably, upon each resolution referred to it. A majority of the members of the Commission will constitute a quorum for reference committee purposes.

Any resolution to be offered before the House of Delegates must be referred first to a reference committee for study and report. No exception can be made to this section without the unanimous consent of the House of Delegates.

Commissions when acting as reference committees may summon officers, members or employees of the Society for such information as may be needed to formulate their conclusions and recommendations.

A member of a reference committee who wishes to make a minority report must refrain from signing the majority committee report and must make his intentions known to the other members of the reference committee while it is in executive session and prior to the presentation of the majority report to the House of Delegates.

Section 4

SUBORDINATION TO THE BOARD OF TRUSTEES

Actions or recommendations of Commissions shall be reported to the Board of Trustees at its next meeting. It shall be the duty of the Commission chairman to report the activities of his Commission to the Board of Trustees. The Board of Trustees shall have the right to approve or disapprove actions or recommendations of Commissions.

ARTICLE IX

DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION

Section 1

ELECTION AND TERMS

The House of Delegates, when the action will be necessary for the ensuing regular session of the House of Delegates of the American Medical Association, shall elect such number of members of this Society to serve as delegate or delegates and alternate or alternates to the House of Delegates of the American Medical Association as this Society is entitled to by the most recent apportionment of the American Medical Association and shall elect them in such years and for such terms as will comply with the applicable provisions of the Constitution and By-Laws of the American Medical Association. Delegates and alternates serving at the time of the adoption of these By-Laws shall serve the terms for which they were elected and no vacancy shall be deemed to exist until the expiration of their elected terms. [Elected in the odd years for a term of two years.]

Section 2

ASSUMPTION OF OFFICE

Delegates and alternates shall assume office on the January 1st next ensuing, and shall serve until their successors are elected and assume office.

Section 3

VACANCY DURING ELECTED TERM; HOW FILLED

If before the termination of his term any delegate dies, resigns, ceases to be a member in good standing of this Society, becomes disabled or for any other reason cannot assume or continue to assume the duties of his office or will be absent from a session or meeting of the House of Delegates of the American Medical Association, the rights and duties of the office devolve on his alternate for the time being or for the remainder of the term as circumstances, in the opinion of the Board of Trustees, may indicate. If the office of an alternate becomes vacant for any reason, the Board of Trustees may appoint a member to serve for the unexpired portion of the term.

ARTICLE X

SESSIONS AND MEETINGS

Section 1

SESSIONS OF THE SOCIETY

The Society shall hold an annual session in September or October at such place and at such time as the House of Delegates may determine. In selecting the site of the annual session, however, the House shall rotate among the counties of the Society as follows: New Castle, Kent, New Castle, Sussex. However, the House of Delegates may, by two-thirds vote of all its members, which vote may be taken by mail by the Secretary, change the time and place of any annual session. The Secretary shall give to each member at least seven days' notice of the place and time of the annual session.

Section 2

GENERAL MEETINGS

During the annual session there shall be held at least one general meeting open to all registered members and guests. The general meeting may rcommend to the House of Delegates the appointment of committees or commissions for scientific investigations of special interest and importance to the profession and to the public. A general meeting, by a two-thirds vote of the active members present and voting, provided that at least fifty active members vote, may order a general referendum on any question pending before the House of Delegates or on any action taken by the House of Delegates, and when so ordered the House of Delegates shall submit such question to the active members of the Society who may vote by mail or in person within fifteen days. If the members voting comprise a majority of all the active members of the Society, a majority of such vote shall determine the question and be binding on the House of Delegates. The House of Delegates may, by a two-thirds vote of its own members, submit any question before it to a general referendum in the above specified manner and it shall be bound by the results. A general meeting may receive a vote on resolutions introduced at any session but the resolutions shall not be binding on the Society until approved by the House of Delegates.

Section 3

SPECIAL SESSIONS

A special session of the Society may be called by the President in his discretion and must be called by him on the written petition of the Board of Trustees, or of ten members of the House of Delegates, or of twenty-five members of the Society.

Section 4

RIGHT OF MEMBERS TO PARTICIPATE IN

All members of the Society may attend and, except as otherwise limited, may participate in the annual session held by the Society, subject only to such reasonable parliamentary rules as may be adopted. Members may also attend meetings of the House of Delegates, except when the House is in executive session. Except with the consent of the House of Delegates, however, no member not a delegate may have the privilege of the floor.

Section 5

SECTIONS

The House of Delegates may provide for a division of the scientific work of the Society into appropriate sections. Such sections may elect their own chairmen and secretaries on the second day of the annual session.

Section 6

REGISTRATION REQUIRED

Before a member can attend or participate in proceedings or activities of the annual session he must register, under such procedure as the Secretary may prescribe.

Section 7

GUESTS

The privilege of attending the annual session may be extended to guests under such conditions as the Secretary may determine.

Section 8

PAPERS AND ADDRESSES

No address or paper read before a general or section meeting, except those of the President and invited guests, shall occupy more than twenty minutes in delivery. In the discussion following a paper or an address at such a meeting no member shall be permitted to speak longer than five minutes on any subject without general consent, nor more than once on any subject, except by unanimous consent, provided that each essayist shall have five minutes in which to close the discussion on his paper. All papers read before the Society shall be typewritten, double spaced with wide margins. Carbon copies will not be accepted. The top of the first page, however, should contain only the author's name, address, teaching position (if any) and hospital appointment. All papers read before this Society shall become the property of the Society and immediately after being read shall be deposited with the Secretary. The authors of such papers shall agree that publication rights are reserved by the Society and, except with the consent of the Committee on Publication, the authors shall not cause them to be published elsewhere until after they have been published in this Society's official publication. A member who volunteers a paper for the annual session shall submit the title and an abstract of the paper to the Secretary on or before the day set therefor by the Committee on Program. A member whose title and abstract have been placed on the program and who is not present in person or by proxy to read the paper shall be barred from the program for two years unless he presents an excuse acceptable to the Committee on Program.

Section 9

MEETINGS OF THE HOUSE OF DELEGATES AND OF THE BOARD OF TRUSTEES

During the annual session the House of Delegates and the Board of Trustees shall meet at such times and places as these By-Laws provide or as the respective bodies themselves determine.

Section 10

RULES OF ORDER

In the absence of any provisions in these By-Laws to the contrary, all general meetings of the Society, of the House of Delegates, of the Board of Trustees, and of the Committees shall be governed by the parliamentary rules and usage contained in the then current edition of Sturgis' *Standard Code of Parliamentary Procedure.*

ARTICLE XI

FINANCE

Section 1

RAISING OF FUNDS

Funds for conducting the affairs of the Society may be raised (1) by such annual dues from members of the Society as may be provided for in these By-Laws or as may be determined by the House of Delegates in accordance with the provisions of Article VI, Section 9; (2) by such special assessments on members as the House of Delegates may determine; (3) revenue from the publications of the Society; (4) by voluntary contributions, devises, bequests, and other gifts; and (5) in any other manner approved by the House of Delegates.

Section 2

FISCAL YEAR

The fiscal year of this Society is from January 1st to December 31st inclusive.

Section 3

SUPERVISION

General supervision of the funds, investments, and expenditures of the Society is vested in the Board of Trustees. The Board of Trustees shall receive the accounts of the Treasurer and of other agents of the Society, audited by a certified public accountant, and present a statement of these accounts in its annual report to the House of Delegates. It shall pass on the sufficiency of the bond given by bonded officers. It shall report on all resolutions appropriating money and shall submit such report to the House of Delegates for authorization or approval. At the annual meeting of the House of Delegates the Board of Trustees shall submit a budget of the expected income and expenses of the Society for the ensuing year. If it approves, the Society shall make the necessary appropriations and impose such conditions on the expenditure of the funds so appropriated as it sees fit, provided in the case of an emergency the Board of Trustees may authorize the expenditure of funds for items not mentioned in the budget for that year.

ARTICLE XII

STANDING COMMITTEES

Section 1

NAMED

The Standing Committees of the Society consist of the following:

(1) Committee on Program
(2) Committee on Publication
(3) Committee on Public Laws
(4) Committee on Budget
(5) Committee on Nominations
(6) Committee on Peer Review and Professional Evaluation

Section 2

REQUIRED REPORTS

Each of these committees annually prior to the annual session shall place in the hands of the Secretary for transmissal to the House of Delegates, a report in writing concerning its activities during the past year. Committee members may be present at the meeting of the House of Delegates when the report of their committee is received and may participate in discussion and debate relative to their reports but unless committeemen are delegates they shall not have the right to vote on the respective reports of their committees in the House.

Section 3

QUALIFICATIONS FOR MEMBERS

A member to be eligible for appointment to a standing committee must have been a member in good standing for at least two years immediately preceding his election or appointment.

Section 4

ELECTION AND TENURE

The members of standing committees with the exception of the Committee on Peer Review and Professional Evaluation shall be elected annually by the House of Delegates to serve one-year terms, beginning at the final session of the Annual Meeting and terminating at the corresponding session of the following Annual Meeting.

Section 5

VACANCIES; HOW FILLED

If an elected committeeman dies, resigns, is removed or fails to serve, the Board of Trustees shall appoint some active member of the Society to serve for the unexpired portion of the term.

Section 6

PROGRAM

The Committee on Program consists of not less than three elected members. The Committee shall determine the character and scope of the scientific proceedings of the Society for each session, subject to the instructions of the President or the House of Delegates. The Committee shall prepare and issue at least thirty days previous to each annual session a program announcing the order in which papers, discussions or other business shall be presented. It shall acquaint those who are to be on the program with the conditions to be attached thereto.

Section 7

PUBLICATION

The Committee on Publication consists of the Secretary and not less than two elected members. The Committee shall supervise the publication of the papers and transactions of this Society, of the program of the annual session and of any special books and documents issued in the name of the Society. It shall publish a medical journal for the Society and appoint an editor and such other necessary personnel, who may or may not be members of the committee, as may be required for that purpose and shall stipulate the terms and conditions thereof. The Managing Editor of the Journal shall give bond in such sum as may be fixed by the Board of Trustees, the premium on such bond to be paid by The Journal. It shall perform such other duties as may be assigned to it by the House of Delegates or the Board of Trustees.

Section 8

PUBLIC LAWS

The Committee on Public Laws consists of not less than five elected members. The Committee shall keep itself informed with respect to laws, court decisions, court proceedings, administrative rules, and proposed and pending legislation relating to public health and such other matters as relate to the objects of this Society.

Section 9

BUDGET

The Committee on the Budget consists of the Treasurer and not less than four elected members. The Committee shall have the immediate supervision of the expenditures under the current budget adopted by the House of Delegates, and shall present to the Board of Trustees for its approval, prior to the annual session, a budget of the expected income and expenses of the Society for the ensuing year.

Section 10

NOMINATIONS

The Committee on Nominations consists of five members. One member shall be selected by the Kent County Medical Society, one shall be selected by the Sussex County Medical Society, and two by the New Castle County Medical Society. The President-Elect will be a member of the Committee, and will serve as chairman.

The name of the member(s) selected by each county medical society will be submitted to the President at least 90 days prior to the Annual Meeting of the House of Delegates.

The Committee shall submit, as set forth in Section 2 of this Article, a list of nominees for such officers and elected committees not otherwise provided for in the By-Laws.

Section 11

PEER REVIEW AND PROFESSIONAL EVALUATION

The Committee on Peer Review and Professional Evaluation consists of a State Chairman, appointed by the President, six members or more appointed by the President of the New Castle County Medical Society, and three members or more appointed by the respective Presidents of the Kent and Sussex County Medical Societies. The Committee shall review all proper complaints and inquiries brought before it by physicians, patients, state and federal government agencies, and other third parties, except those complaints and inquiries that would fall under the purview of other existing committees. Further, the Committee shall concern itself with establishing criteria for mode of practice with all associated ramifications, medical necessity, utilization in home, office, and institution. Reasonable rules and operational procedure shall be established by the Committee in the development of positive programs as they evolve.

ARTICLE XIII

ETHICS

The Principles of Medical Ethics of the American Medical Association in force at the time of the adoption of these By-Laws and as they may from time to time thereafter be amended by the American Medical Association shall govern the conduct of members of this Society in their relation to each other and to the public.

ARTICLE XIV

OFFICIAL PUBLICATION

The official publication of this Society is the Delaware Medical Journal, in which shall be published all official society notices and the transactions, or abstracts thereof, of the House of Delegates, of the general meetings of the Society, and of the meetings of the Board of Trustees.

ARTICLE XV

AMENDMENTS

Section 1

PROCEDURE

The House of Delegates may amend these By-Laws at any annual session by unanimous consent provided the motion or resolution to amend was introduced the day before the amendment was adopted and provided further that at least twenty-five members of the House are present and voting when the amendment is adopted. In the event of a dissenting vote, the amendment shall lie over for action by the House at the subsequent annual session at which time it will be held to have been adopted if two-thirds of the members of the House present and voting vote favorably for the adoption, and provided that the proposed amendment shall have been published in the official publication of this Society at least two months prior to the annual session at which it is adopted.

Section 2

PUBLICITY

On the adoption of any amendment to these By-Laws a printed copy of the same shall be mailed by the Secretary to each member within thirty days.

ARTICLE XVI

REPEAL OF PREVIOUS BY-LAWS AND MOTIONS

On the adoption of these By-Laws (1) all previous By-Laws and (2) motions of record and rules and regulations in conflict with these By-Laws are hereby repealed, provided, that all officers, delegates, and elected committeemen now in office shall continue their incumbency until their successors are duly elected as provided in these By-Laws.

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INDEX

Page
Amendments
  Notification of 16
  Procedure 16
American Medical Association
  Code of Ethics 2, 6, 15
  Delegate to 12
  Judicial Council 6
  Listing of members 9
Assessments 5, 10
  Exemptions from 5
Board of Medical Examiners 10
Commissions
  As Reference Committees 12
  Composition 11
  Duties 12
  Subordination to Board of Trustees 12
Committees, special 10
Committees, standing
  Duties 14, 15
  Election 14
  Listed 14
  Qualifications 14
  Reports 10, 14
  Vacancies 15
Component Societies
  By-Laws 6
  Charters 5
  Defined 5
  Limitations of Authority 6
  Membership 6
  Representation 6, 7

Page
  Revocation of Charters 5
  Right of Physician to select 7
  Secretary's duties 7
  Transfer between 7
  Treasurer's duties 7
Board of Trustees
  Composition 11
  Duties of Trustees 11
  General duties 11
  General Powers 10
  How Elected 7
  Meetings 11
  Report 10
Disciplinary Action 6
  Appeals 6
Dues 5, 7, 10
Ethics, Principles of 2, 15
Finance
  Fiscal year 14
  Supervision 14
Funds
  Benevolence 11
  Defense 11
House of Delegates
  Composition 9
  Conduct of Business 9
  General Powers 9
  How elected 6
  Qualifications for election 9
  Reporting of proceedings 10

Page
  Special sessions 10
  Time of meetings 10
  Vacancies during meetings 10
Meetings, general 13
  Addresses 13
  Guests 13
  Registration 13
  Right to participate 13
  Sections 13
  Special 13
Membership
  Classes 4
  Rights 4
  Standing, defined 5
Name 4
Objects 4
Officers
  Duties in general 8
  Election and Tenure 8
  Executive Director 8, 11
  President 8
  President-Elect 8
  Qualifications 8
  Secretary 9
  Treasurer 9
  Vacancies 8
  Vice President 8
Publication, official 13, 15, 16
Resolutions and Memorials 10, 12
Rules of Order 14

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